

**МЕТОДИЧЕСКИЕ УКАЗАНИЯ**  
**И**  
**КОНТРОЛЬНЫЕ ЗАДАНИЯ**  
**ПО КУРСУ «Английский язык»**  
**ДЛЯ СТУДЕНТОВ ЗАОЧНОЙ ФОРМЫ ОБУЧЕНИЯ**  
технических специальностей

**Введение**

Иностранный язык - один из немногих предметов, изучение которых обязательно во всех вузах. Владение иностранным языком необходимо специалисту любого профиля, так как способствует поиску, извлечению и широкому практическому использованию информации из разных источников, обеспечивает возможность контактов с зарубежными коллегами. Процесс изучения иностранного языка чрезвычайно развивает мыслительные способности, тренирует память, расширяет кругозор.

Курс заочного обучения английскому языку предполагает выработку следующих навыков и умений:

- чтение литературы по специальности на английском языке с целью извлечения необходимой информации;
- перевод текстов по специальности с английского языка на русский;
- беседа на английском языке на темы, связанные со специальностью.

**Программа курса английского языка**

**1. Структура курса**

В соответствии с действующими учебными планами на курс заочного обучения английскому языку отводится 50-60 часов аудиторных занятий (установочных, контрольно-закрепительных, итоговых) и около 300 часов самостоятельной (внеаудиторной) работы. Количество учебных часов может быть несколько уменьшено или увеличено в зависимости от факультета и специальности.

Программа по английскому языку включает лексический и грамматический материал, необходимый для чтения и понимания литературы по специальности.

**Программа предполагает преемственность вузовского курса обучения по отношению к школьному, поэтому нами учтена возможность возобновить изучение английского языка после**

**значительного перерыва, вызвавшего утрату большинства навыков и умений.**

## **2. Содержание курса**

### **2.1. Фонетика**

Фонетический строй английского языка. Система гласных. Система согласных. Основные правила чтения букв и буквосочетаний. Ударение. Членение речевого потока. Ритмическая группа. Синтагма. Основные интонационные типы.

### **2.2. Лексика**

Морфологическая структура слова. Словообразовательные модели. Префиксальное и суффиксальное словообразование. Роль суффиксов в распознавании частей речи. Интернациональные префиксы и суффиксы. Переход слов из одной части речи в другую. «Ложные друзья» переводчика. Понятие фразеологического оборота. Идиома. Синонимы, антонимы, омонимы. Сокращения.

К концу обучения лексический минимум должен составить примерно 2000-2500 единиц. В этот минимум не входят слова и выражения, усвоенные в средней школе (не менее 350 единиц) и интернациональная лексика (т.е. слова, имеющие сходное звучание и одинаковое значение в русском и английском языках).

### **2.3. Грамматика**

#### **2.3.1. Морфология**

Артикль. Определённый, неопределённый артикль. Опущение артикля.

Имя существительное. Грамматические категории числа и падежа имен существительных. Род существительных.

Имя прилагательное. Степени сравнения прилагательных. Место прилагательного в предложении.

Имя числительное. Количественные и порядковые числительные. Хронологические даты. Дробные числительные.

Местоимение. Личные, указательные, притяжательные, относительные, вопросительные, неопределённые, возвратные местоимения. Местоимение *it*.

Глагол. Грамматические категории глагола. Вспомогательные глаголы. Действительный и страдательный залого.

Отрицательная и вопросительная формы. Система видо-временных форм глагола (Indefinite, Continuous, Perfect, Perfect Continuous). Сравнительная характеристика форм настоящего, прошедшего и

будущего времени. Модальные глаголы. Повелительное наклонение. Сослагательное наклонение. Неличные формы глагола: инфинитив, причастие, герундий.

Наречие. Образование наречий. Степени сравнения наречий.

Предлог. Функции и значения предлогов. Сложные предлоги. Многозначность предлогов.

Союз. Простые, производные и составные союзы.

#### 2.3.2. Синтаксис

Типы предложений. Простое предложение. Главные и второстепенные члены предложения. Прямой и обратный (инверсия) порядок слов. Виды вопросительных предложений. Сказуемое простое и составное. Место второстепенных членов предложения. Сложное предложение. Сложносочинённое и сложноподчинённое предложение. Виды придаточных предложений. Прямая речь, косвенная речь. Согласование времён. Инфинитивные конструкции. Причастные обороты. Абсолютная причастная конструкция. Конструкции с герундием. Эмфатические обороты.

### 3. Учебные тексты и тексты для дополнительного чтения

При изучении английского языка студент использует следующие виды учебной литературы:

- тексты контрольных работ;
- учебные тексты;
- тексты для дополнительного чтения.

Цель контрольной работы – помочь студенту в самостоятельном изучении английского языка и проверить, насколько хорошо он усвоил пройденный учебный материал. Требования к выполнению и оформлению контрольных работ приведены ниже.

Чтение учебных текстов поможет студенту выработать навыки, необходимые для успешного овладения английским языком, закрепить соответствующие грамматические правила, приобрести необходимый запас слов. Объём прочитанных текстов должен составлять 12000 и 15 000 печатных знаков\* на первом и втором курсе, соответственно, т.е. около 30 000 печатных знаков за полный курс

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\* Подсчёт количества печатных знаков: число печатных знаков (считая знаки препинания) в полной строке умножается на количество строк. Обычно на странице бывает 1800 – 2000 знаков.

обучения. Тексты для чтения включены в Методические указания и контрольные задания.

Дополнительное чтение имеет целью закрепление и углубление знаний по английскому языку. За полный курс обучения студент должен подготовить дополнительное чтение в объёме 20 000 печатных знаков, из них:

I курс: адаптированные тексты по широкому профилю вуза или специальности в объёме 10 000 печатных знаков.

II курс: неадаптированные или частично адаптированные тексты по специальности в объёме 10 000 печатных знаков.

Тексты для дополнительного (внеаудиторного) чтения также включены в Методические указания и контрольные задания.

#### **4. Итоговый контроль**

В соответствии с учебным планом в конце 1-3 семестров студент сдаёт зачёт, а в конце второго года обучения – итоговый экзамен.

Для получения зачёта или допуска к экзамену студент должен:

- a). В срок сдать контрольные работы (на I курсе – № 1 и 2, на II - № 3 и 4), при необходимости исправить ошибки или выполнить всю работу заново, для получения оценки «зачтено»;
- b). Сдать норму чтения и перевода (учебные тексты, тексты контрольных работ, тексты для дополнительного чтения).

Содержание билета на экзамене по английскому языку:

- 1) Изучающее чтение и передача содержания в виде полного письменного перевода незнакомого текста объёмом 800 - 1000 печатных знаков за 1 академический час (со словарём).
- 2) Ознакомительное чтение незнакомого текста объёмом до 1200 печатных знаков и изложение его содержания на русском или английском языке. Время на подготовку 15 минут (без словаря).
- 3) Просмотровое чтение и перевод на русский язык одного из текстов для обязательного чтения (без словаря). Время на подготовку – 2-3 минуты.

#### **5. Рекомендуемая литература**

##### **5.2. Учебники и учебные пособия.**

1. Английский язык. Методические указания и контрольные задания для студентов технических специальностей заочной формы обучения. СПбГУАП, 2003.

2. Э.С. Дудорова. Through Fundamentals to Communicative English. От основ к разговорному английскому языку. Санкт-Петербург, ГУАП, 1998
3. Л.В. Хведченя, Р.В. Хорень. Английский язык для поступающих в вузы. Минск, «Вышэйша школа», любой год издания.

#### 5.3. Грамматические справочники.

1. И.П. Крылова, Е.В. Крылова. Практическая грамматика английского языка. Учебное пособие. М., 1997
2. Ю.Б. Голицынский. Грамматика. Сборник упражнений. Санкт-Петербург, 2001
3. Любой грамматический справочник.

#### 5.4. Словари

1. Англо-русский словарь на 70 тысяч слов и более. Любое издание.
2. Отраслевые словари.
3. Русско-английский словарь (любой).

### Методические указания

#### Произношение и чтение

Правильное произношение – гарантия понимания не только устной, но и письменной речи, так как чтение и письмо происходят под контролем слуха и сопровождаются проговариванием на уровне внутренней речи. Неправильное чтение слова приводит к его неправильному запоминанию и неузнаванию.

Основные сложности овладения английским произношением обусловлены следующими причинами:

1) Несовпадением звуковых систем русского и английского языков.

Следует изучить фонетическую систему английского языка, научиться правильно и четко произносить звуки.

2) Отсутствием автоматизации фонетических навыков.

Следует регулярно выполнять фонетические упражнения, прослушивать звукозаписи и передачи с английской речью, смотреть фильмы и телепередачи на английском языке.

3) Частым несовпадением звучания и написания.

Следует изучить правила чтения букв и буквосочетаний, регулярно их повторять.

4) Несовпадение интонационных систем английского и русского языков.

Следует изучить правила слогаделения, членения речевого потока на ритмические группы и синтагмы, усвоить основные интонационные модели.

### **Лексика**

За полный курс обучения студент должен выучить и активно использовать около 2500 новых лексических единиц, т.е. по 1200 слов на каждом курсе. Потенциальный запас лексики может быть почти удвоен за счет:

- 1) усвоения системы английского словообразования;
- 2) запоминания значений словообразовательных элементов (префиксов, суффиксов), что позволит выводить значения производных слов;
- 3) изучения интернациональной лексики.

Работая над переводом текста или упражнения, следует выписывать в тетрадь-словарик встречающиеся незнакомые слова в их исходной (словарной) форме: глаголы – в неопределенной форме, существительные – в форме единственного числа, прилагательные – в форме положительной степени. Найдя слово в словаре, внимательно прочитайте всю словарную статью. Помните, что словарь чаще всего дает не однозначный перевод слова с одного языка на другой, а предлагает несколько, иногда много, значений. Правильный перевод возможен только с учетом общего смысла, контекста.

Заучивать следует в первую очередь наиболее часто встречающиеся слова. Их надо сразу выделять в тетради-словарике и работать над ними: повторять, писать под диктовку, составлять с ними словосочетания и предложения, стараться в дальнейшем находить в тексте их однокоренные слова, определять их синонимы, антонимы и т.д. Нельзя забывать, что только постоянная работа над лексикой поможет выучить и активно использовать нужное количество слов.

### **Грамматика**

Грамматика обеспечивает связь слов в предложении и позволяет понять смысл текста. В каждой контрольной работе указаны грамматические темы, подлежащие изучению.

Пользуясь учебниками, пособиями, справочниками, таблицами, изучите данный раздел, выполните несколько упражнений, чтобы

закрепить пройденное. В дальнейшем, читая тексты или слушая английскую речь, старайтесь опознавать выученную грамматическую форму. Особое и постоянное внимание следует уделять глагольным формам. Работайте над каждым глаголом: определите его видо-временную форму, проспрягайте в уже изученных временах, образуйте вопросительную и отрицательную формы.

Ни один грамматический раздел не должен оставаться неувоенным. В случае необходимости следует обращаться за консультацией (письменной или устной) к преподавателю.

### **Работа над текстом**

В зависимости от цели, которую ставит перед собой читающий, и от скорости чтения выделяют:

- изучающее чтение;
- селективное (быстрое) чтение, включающее ознакомительное, просмотровое и поисковое.

Изучающее чтение предполагает полное и адекватное понимание всей информации текста.

Ознакомительное чтение предусматривает быстрое прочтение всего текста (скорость около 180-190 слов в минуту) с полным пониманием основной информации текста.

Просмотровое чтение позволяет выяснить, о чем идет речь в тексте. Этот вид чтения используется, когда необходимо определить, насколько важна или интересна для читающего информация, содержащаяся в тексте.

Поисковое чтение даёт возможность находить в тексте те элементы информации, о которых заранее известно, что они имеются в тексте.

Курс заочного обучения английскому языку предусматривает освоение всех видов чтения, при некотором доминировании изучающего.

Изучающее чтение предполагает полный письменный или устный перевод текста с использованием словаря.

При письменном переводе текста рекомендуется следующая последовательность действий:

1. Прочитать весь текст и постараться понять, о чем идет речь; это поможет выбрать нужный эквивалент незнакомого слова при пользовании словарем.
2. Прочитать первое предложение, обращая внимание на знаки препинания, знакомые слова, союзы, артикли, и постараться

определить, простое это предложение или сложное. Каждое простое предложение в составе сложного следует переводить отдельно.

3. Найти сказуемое и подлежащее, ориентируясь на порядок слов и формальные признаки.
4. Перевести двучлен «подлежащее – сказуемое». Перевод этого двучлена и составит ядро перевода всей фразы.
5. Перевести слова, относящиеся к подлежащему (группу подлежащего).
6. Перевести группу сказуемого.
7. Перевести то, что осталось за рамками групп подлежащего и сказуемого.
8. Перевести все предложение целиком.
9. Отредактировать перевод, т.е. проверить, насколько четко и ясно передана мысль автора, соответствует ли ее изложение нормам русского языка.

Не следует выписывать незнакомые слова сразу из всего текста и переводить их изолированно. Этот способ не оправдывает себя: во-первых, о значении некоторых слов можно догадаться, переведя предыдущую часть текста. Во-вторых, придется выписывать либо все значения многозначного слова, либо первое попавшееся, которое может и не подойти для данного предложения, и тогда нужно будет снова обращаться к словарю, отыскивая другое, подходящее значение слова.

При устном переводе текста последовательность действий остается практически той же. Следует только более тщательно переводить новые слова, что поможет при сдаче текста преподавателю.

Все виды селективного (быстрого) чтения предполагают охват общего содержания текста без использования словаря. Следует постараться уловить смысл прочитанного, опираясь на знакомые слова. Контроль понимания может осуществляться разными способами: студент должен изложить своими словами на русском или английском языке содержание всего текста или его части; составить план пересказа; озаглавить абзацы или другие структурные единицы текста; ответить на вопросы или выбрать правильный ответ из нескольких предложенных вариантов и т.д.



### **Дополнительное чтение**

Дополнительное чтение литературы на английском языке способствует расширению словарного запаса, повторению и закреплению пройденного грамматического материала, совершенствованию техники чтения, автоматизации навыка работы со словарем. При работе над дополнительными текстами следует все незнакомые слова и выражения выписывать в отдельную тетрадь-словарь в исходной (словарной) форме.

Для удобства пользования рекомендуется указывать номер страницы, с которой выписаны слова. Можно даже пронумеровать абзацы и отмечать те слова, которые студент отбирает для выучивания.

При сдаче дополнительного чтения студент должен:

- 1) уметь правильно читать любой отрывок из текста;
- 2) предъявить преподавателю для контроля тетрадь-словарь с выписанными и переведенными незнакомыми словами из прочитанного текста;
- 3) адекватно перевести на русский язык любой отрывок из прочитанного текста, пользуясь тетрадью-словарем. Полный письменный перевод текста делать не рекомендуется. При ответе преподавателю пользоваться письменным переводом запрещается;
- 4) знать отобранные и выученные в процессе подготовки дополнительного чтения новые слова;
- 5) уметь объяснить любое фонетическое, лексическое, грамматическое явление текста в объеме, предусмотренном программой для данного курса.

### **Контрольные задания**

На I курсе студенты выполняют контрольные задания N1 и N2, на II курсе – N3 и N4. Выбор варианта контрольной работы осуществляется в соответствии с последней цифрой номера студенческого билета (шифра): 1-й вариант выполняют студентами с номерами шифра, оканчивающего на 1, 2 или 3; 2-й вариант – для студентов с последней цифрой шифра 4, 5 или 6; наконец, 3-й вариант – для студентов с последней цифрой шифра 7, 8, 9 или 0. Выполненные контрольные работы присылаются или сдаются в деканат заочного отделения в установленные сроки. При этом помните, что высылать контрольную работу следует с учетом того,

что Вам может потребоваться время на исправление работы. Особенно актуально это для студентов, готовящихся сдавать итоговый экзамен по английскому языку. Контрольная работа должна быть зарегистрирована. Работы, не имеющие входящего номера, на рецензию не принимаются.

При оформлении контрольных заданий придерживайтесь следующих указаний:

- Выполняйте каждую контрольную работу в отдельной тетради. На обложке напишите свою фамилию, имя, отчество, адрес, название и фамилию автора учебника, по которому вы занимаетесь, номера проработанных уроков.
- Работа должна быть написана аккуратно, четко, разборчиво, без сокращений. Для замечаний, объяснений, указаний рецензента оставляйте в тетради широкие поля.
- Выполняйте работы в той последовательности, в которой они даны в настоящем пособии. Присылайте на проверку только одну работу. Во избежание возможного повторения ошибок следующую работу выполняйте и высылайте на проверку только после получения рецензии на предыдущую.
- Обязательно указывайте номер упражнения и переписывайте задание. Модель выполнения можно не переписывать.
- При выполнении работы лист следует разделить пополам и слева писать предложения по-английски, а справа – их перевод.

Если контрольная работа выполнена неясно, небрежно, не полностью или не в соответствии с указаниями, она возвращается студенту без проверки.

#### **Исправления контрольной работы на основе рецензии**

Проверенная преподавателем контрольная работа возвращается студенту с рецензией и оценкой «зачтено» или «не зачтено». Студент должен ознакомиться с рецензией, с исправлениями, замечаниями, указаниями на полях работы, проанализировать их.

Если работа зачтена, но в ней допущен ряд ошибок, то их надо исправить. Руководствуясь указаниями рецензента, повторите соответствующий грамматический материал, проверьте значения неверно переведенных слов по словарю и т.д. Обязательно уясните сущность каждой допущенной ошибки. Все предложения, в которых были ошибки, перепишите в конце контрольной работы в

исправленном виде. Контрольная работа с исправлением ошибок предъявляется преподавателю на зачетно-экзаменационной сессии.

Если работа не зачтена, ее следует переделать целиком или частично, в зависимости от указаний преподавателя, и вновь выслать на проверку вместе с незачтенной работой.

Контрольные работы являются учебными документами, которые необходимо сохранять и предъявлять на зачетах и экзаменах. При сдаче зачета или экзамена преподаватель может провести опрос и по контрольной работе.

#### **Письменные консультации**

Сообщайте своему рецензенту обо всех возникающих у вас в процессе изучения английского языка затруднениях и обращайтесь к нему за консультацией по вопросам, которые вы не можете решить самостоятельно.

#### **Занятия по английскому языку во время сессии**

На занятиях по английскому языку студент должен иметь:

- англо-русский словарь;
- русско-английский словарь;
- прорецензированные контрольные работы;
- переведенные учебные тексты, тексты по дополнительному чтению и тетрадь-словарь с выписанными и переведенными словами к ним;
- тетради с дополнительными упражнениями по грамматике;
- используемые учебники и пособия;
- данные методические указания.

#### **График представления контрольных работ**

Контрольные работы №№ 1 и 3 (для студентов 1 и 2 курсов, соответственно) высылаются на адрес университета или сдаются на кафедру иностранных языков до **20 ноября**.

Контрольная работа № 2 сдается до **29 апреля**.

Контрольная работа № 4 сдается до **30 марта**.

*1 год обучения*

**КОНТРОЛЬНОЕ ЗАДАНИЕ № 1**

**FUNDAMENTALS OF ELECTRONICS**

**Для правильного выполнения задания № 1 необходимо усвоить следующие разделы курса грамматики английского языка по любым учебникам:**

1. Артикли. Множественное число и притяжательный падеж имен существительных. Предлоги как показатели падежных отношений. Порядок слов в английском предложении. Использование существительных в функции определения.
2. Степени сравнения имен прилагательных и наречий. Сравнительные конструкции.
3. Имя числительное.
4. Местоимения: личные, притяжательные, вопросительные, указательные, неопределенные и другие.
5. Формы настоящего, прошедшего и будущего времени действительного залога изъявительного наклонения. Спряжение глаголов *to be, to have* в *Present, Past, Future Indefinite*.
6. Простое распространенное предложение: прямой порядок слов в утвердительной и отрицательной форме; обратный порядок слов вопросительного предложения.оборот *“there + be”*.
7. Словообразование – основные суффиксы и префиксы. Словосложение. Использование слов, одинаковых по форме, представляющих собой различные части речи.

**После изучения указанного выше материала можно приступить к выполнению задания.**

**ТЕКСТЫ ДЛЯ ИЗУЧАЮЩЕГО ЧТЕНИЯ,  
ПЕРЕВОДА И ПОВТОРЕНИЯ ГРАММАТИЧЕСКОГО  
МАТЕРИАЛА**

**Text 1 (A). History of Electronics**

Electronics is one of the main sciences and it surrounds us everywhere.

Electronics was born in the 19<sup>th</sup> century and first established itself in wireless telegraphy. For a long time afterwards it was used only for the purpose of communication.

More intensive development of radiolocation began in the earliest forties. All these years the vacuum tube was the heart of electronics.

The first semiconductor device – a transistor – was invented in 1948. It meant another important advance in the development of electronics, because semiconductors possessed much more valuable advantages over electron vacuum tubes. Thus, electronics became the study of electron motion in vacuum, solid bodies and gasses.

This opened up new fields of application. Complex electronic systems control the work of the largest plants and power stations. Electronic computers capable of performing the most complex mathematical calculations are now widely used in scientific research. The latest models of electronic machines perform such operations as calculating the most accurate designs of jet-planes and the longest trajectories of artificial Earth satellites, telling the fishermen where the catch is the biggest, speed regulation, automatic control, etc.

Today electronics has started a new era. Different electronic devices and instruments have taken the place of man. Some industries such as the manufacture of goods are controlled by electronic robots. Planes and rockets are also electronically controlled. Electronic computers are becoming very good at routine clerical work in offices and factories. Progress in space research would be impossible without computers making thousands of operations per second.

**Text 1 (B). Electronics as a Science**

Electronics as a science studies the properties of electrons, the laws of their motion, the laws of transformation of various kinds of energy.

Electronics is a science, which deals with devices and instruments that are operated by the control of the movement of electric charges in a

vacuum, in gasses, or in semiconductors; or with the processing of information or the control of energy by such devices. This definition covers the whole complex family of vacuum and gaseous electron tubes and their application. It also includes semiconductor and transistor technologies to process information or to convert energy. Without electronics we would not have cybernetics, cosmonautics and nuclear physics. It is no mistake to compare the birth of electronics to such great achievements of mankind as the discovery of fire, and penetration into the secrets of the atom. Shortly speaking, electronics is not so much a new subject; it is rather a new way of looking at electricity.

#### **Text 1 (C). Application of Electronics**

Large-scale application of electronics made it possible to revolutionize our life. At present it is difficult to enumerate all branches of science and technology, which are based on electronic techniques.

Electronics surrounds us everywhere. It seems to influence every aspect of human activity. Electronics is at the heart of TV and radio reception, broadcasting, radio and sound location, electronic computation and so on. Huge radio telescopes, equipped with sensitive instruments and powerful amplifiers enable men to penetrate onto the remotest corners of space, discover new and puzzling phenomena of nature. Electronic computers calculate the trajectories of spaceships, launch and control the rockets. It is the intensive development of radiolocation that gave start to radio electronics. For a long time electronics was used only for communication and for ensuring amplification and transformation of various signals in applied sciences. Soon men witnessed another stage in the development of electronics. Integrated circuits came into being (появились). Their application allowed engineers to reduce the dimensions of electronic devices and increase their reliability.

#### **Text 1 (D). Development of Microelectronic Devices**

The development of the transistor initiated the development of microelectronic devices. Very small electronic circuits of great reliability were needed by those organizations, which were concerned with sending equipment into space since the weight of the missile was of primary importance.

Microelectronic devices (integrated circuits) are made from wafer-thin pieces (тонкие пластины) of semiconductor material, such as silicon. A

small chip of silicon can contain a very large number of electronic components built into the circuit.

Integrated circuits (IC) have a wide variety of processing and storage functions. Today it is possible to have all circuits needed for a microcomputer, for example, on a single semiconductor chip, which is about the same size as the early ICs that contained only a few components. Large-Scale Integrated circuits (LSI), containing thousands of components, are now commonplace. Each IC (chip) is mounted in a package so that electrical connections can be made.

The availability of these small microelectronic devices allows the electromechanical devices in industrial and domestic equipment to be replaced by much more compact control systems, and has given rise to developments in automation which were not previously possible.

The use of microelectronic devices in computers has had a considerable effect in that computer power is now available in the office, on the shop floor, and at home.

## **Контрольная работа №1**

### **Вариант 1**

**1. Вставьте в предложения глагол to be в форме единственного или множественного числа is/are.**

1.The news I have receive ... good. 2.The sheep ... in the field. 3.Fish ... not cheap today. 4.The stairs ... very clean. 5.Her wages ... low.

**2. Употребите в данных предложениях личные местоимения.**

1.My husband has a new car, but ... doesn't like ... very much. 2.Pete has three sons. He plays golf with ... in his free time. 3.Steve's new teacher is Mr. Ford. Steve likes ... a lot. 4.They are very good people. I know ... . 5.I have a sister. I love ... very much. 6.We are good students and our teacher likes to teach ... .

**3. Заполните пропуски притяжательными местоимениями в простой или абсолютной форме.**

1.We have a nice flat. ... flat is in a new house. 2.This is my car. ... is a 1992 model. 3.Jim, tell me, isn't that ... girl-friend over there? 4.I know that he has lost ... text-book, perhaps you can lend him ... . 5.Ann is glad to see ... friends again. 6.I am not happy about my new house, but ... is just awful. I can't understand why they've bought it.

**4. Перепишите и письменно переведите предложения, обращая внимание на перевод неопределенных местоимений и наречий.**

1. Everywhere in Moscow you will see new buildings. 2. The lecturer will tell us something about the history of Great Britain. 3. Any station in our Metro is very clean and beautiful. 4. Some new districts appeared in St. Petersburg during the last 5 years. 5. You can't find this book anywhere. 6. Anyone who comes to St. Petersburg tries to visit the Hermitage. 7. No engineer can solve this problem without the help of computers.

**5. Напишите форму множественного числа от данных существительных:**

boy, wife, man, mouse, sheep, matchbox, woman-teacher, sister-in-law, table, story, leaf

**6. Поставьте выделенные существительные во множественное число. Произведите все необходимые изменения.**

1. I have hurt my *foot*. 2. Put *the box* on the *shelf*. 3. This *factory* has a good *laboratory*. 4. Their *child* studies very well. 5. There is a *deer* near our cottage. 6. His *speech* was very interesting.

**7. Перепишите данные ниже предложения. Определите по грамматическим признакам, какой частью речи является слово, оформленное окончанием -s, какую функцию это окончание выполняет, т.е. служит ли оно а) показателем 3л.ед.ч. в Present Indefinite (Present Simple), б) признаком множественного числа существительного, в) показателем притяжательного числа имени существительного. Предложения переведите.**

1. The lectures of professor Nelson are very interesting. 2. He lectures on Mathematics. 3. What is your friend's profession? 4. Each lesson lasts 40 minutes. 5. In autumn leaves begin to fall from the trees. 6. The train leaves at 9.

**8. Вставьте вместо точек s, 's, s', где необходимо.**

1. This is a new book of Pushkin... poem... . 2. The ship... crew consisted of foreign sailors. 3. These film... are Sam... and Frank... parents... . 4. They spent a week ... holiday at the Barton... .



**9. Перепишите следующие предложения, содержащие разные формы сравнения, и переведите их на русский язык.**

1.The oftener you visit the Hermitage, the more you like it. 2.Winter is the coldest season of the year. 3.Moscow today is 5 times as big as at the beginning of the 20<sup>th</sup> century. 4.St. Petersburg is the second largest city after Moscow. 5.The St. Petersburg University is not so old as the Moscow or Kazan Universities.

**10. Раскройте скобки и поставьте прилагательные в нужную степень.**

1.He is the (strong) boy in the whole school. 2.Which of the two men is (tall)? 3.Here is the (late) news. 4.He didn't take the medicine yesterday and he feels (bad) today. 5.Who is your (good) friend? 6.There were (few) new words in this text and it took me (little) time to read it.

**11. Перепишите данные предложения, определите в них видо-временные формы глагола и укажите их инфинитив. Предложения переведите.**

1.In 1712 St. Petersburg became the capital of Russia. 2.For citizens of St. Petersburg the embankment of the Neva is one of the most beautiful places in the world. 3.St. Petersburg got its name in 1703. 4.I shan't go out now as I have a lot of work to do. 5.They do their shopping every day.

**12. Перепишите и переведите приводимые ниже предложения. Поставьте их в отрицательную форму. Задайте общий и специальный вопрос к каждому предложению.**

1.Tim does his morning exercises every day. (What?). 2.He always smokes before lunch. (When?) 3.Mary's mother taught her how to cook. (Whom?) 4.Yesterday we spent a lot of money. (What?) 5.My sister will wear her new dress. (When?) 6.We shall join them later. (Why?)

**13. Прочтите и устно переведите текст. Перепишите и письменно переведите 3-й абзац текста.**

### **Basic Solid-State Principles**

In a conductor, electric current flow is a movement of free electrons. The outer or valence electrons of a good conductor are loosely bound to the atom. At room temperature the thermal energy causes approximately one electron to detach from each atom and become free to move and result in a current flow when an electric potential is applied.

Insulators are materials in which outer electrons are tightly bound to the atom and no electrons are free to move. Thus, no current can flow when voltage is applied.

Between these two major categories is a class of materials called semiconductors. As the name implies, a semiconductor is a material with conductivity roughly midway between conductors and insulators. It is not just a poor conductor; it has two important properties. First, its resistance normally decreases with increase of temperature, while in conductors resistance slightly increases with temperature. Second, the flow of current in a semiconductor may be caused either by a flow of negative electrons or by a movement of missing sites in the opposite direction. If an atom has one outer electron missing, a loosely bound electron from a neighbouring atom can jump into it, leaving behind a new vacant site; this, in turn, can be filled by an electron from the third atom and so on. The impression is as if the vacant site has moved. Such vacant sites are called "holes" and since a negative electron is missing, the hole can be said to have a positive charge.

Semiconductor materials in which conduction is due to a flow of electrons are called n-type materials and those in which conduction is due to the movement of positive holes are called p-type.

### **Вариант 2**

**1. Вставьте в предложения глагол to be в форме единственного или множественного числа is/are.**

1.Where ... the money? 2.His trousers ... too large for him. 3.Mathematics ... my poorest subject. 4.His savings ... in the bank. 5.Those glasses ... his.

**2. Употребите в данных предложениях личные местоимения.**

1.This is my new coat. Look at ... . 2.My uncle is old. He wants to live with ... and my parents. 3.How is your nephew? Say "Hi" to ... . 4.You are ill, Pete. We want to be with ... in the evening. 5.Mary and I are good students, so our teacher likes ... . 6.Linda isn't here. Can I give ... a message?

**3. Заполните пропуски притяжательными местоимениями в простой или абсолютной форме.**

1.I have a dog. The dog is ... . 2.I have a piano in ... room. 3.Tell him not to forget ... paper, she must not forget ..., either. 4.I managed to keep ... books dry, but you got ... wet, I see. 5.Sarah is dressed very well. Most of ... clothes are expensive. 6.Jim has left. These cannot be ... keys.

**4. Перепишите и письменно переведите предложения, обращая внимание на перевод неопределенных местоимений и наречий.**

1.Some electronic devices find wide application in every house. 2.You will find this material nowhere but in the encyclopedia. 3.Something happened to my computer. It doesn't work. 4.Any result in our experiment will be of great importance for the whole research. 5.If you have no money, you cannot buy anything. 6.She said nothing. 7.There was no one in the room.

**5. Напишите форму множественного числа от данных существительных:**

piano, knife, woman, child, deer, classroom, manservant, brother-in-law, bench, day, trout

**6. Поставьте выделенные существительные во множественное число. Произведите все необходимые изменения.**

1.This is an English *dictionary*. 2.The last *leaf* fell from the *tree*. 3.Where is the *brush*? 4.The *roof* of the *house* with covered with snow. 5.There is a *sheep* in the *field*. 6.There is an angry *wolf* in the *forest*.

**7. Перепишите данные ниже предложения. Определите по грамматическим признакам, какой частью речи является слово, оформленное окончанием -s, какую функцию это окончание выполняет, т.е. служит ли оно а) показателем 3л.ед.ч. в *Present Indefinite (Present Simple)*, б) признаком множественного числа существительного, в) показателем притяжательного числа имени существительного. Предложения переведите.**

1.The St. Petersburg technical University trains specialists in many fields.  
2.Trains from Moscow arrive in St. Petersburg at the Moscow Railway

Station. 3.Flats in new houses are very comfortable. 4.The Hermitage houses a big collection of Western European Art. 5.This problem needs a special approach. Our country's needs in electricity will continue to grow.

**8. Вставьте вместо точек s, 's, s', где необходимо.**

1.This man was Paul... and Kate... teacher... of music. 2.My relatives spent a two week... holiday with the Barton... . 3.This winter... life was short but bright. 4.The boy... got their first week... salary and were very happy.

**9. Перепишите следующие предложения, содержащие разные формы сравнения, и переведите их на русский язык.**

1.There are more than 50 schools of higher learning in St. Petersburg. 2.Mathematics is as important for technical students as Physics. 3.This new apparatus is 4 times as powerful as the old one. 4.These machine tools are not so efficient as the new ones. 5.The more systematic are our studies, the deeper is our knowledge.

**10. Раскройте скобки и поставьте прилагательные в нужную степень.**

1.Of the two sisters Mary is the (beautiful). 2.Which do you like (good), orange juice or lemon juice? 3.The Nile is the (large) river in Africa. 4.Let's go by car. It's (cheap) than by train. 5.This is (comfortable) room in my flat. It is (big) and (light) than other rooms. 6.Kate is the (young) of my five sisters.

**11. Перепишите данные предложения, определите в них видо-временные формы глагола и укажите их инфинитив. Предложения переведите.**

1.There is a wide system of extramural education in our country. 2.In two years, my friend will become a specialist in the field of radio engineering. 3.She got up, washed, had breakfast and went to school. 4.Our classes begin at 8.30. 5.We saw an interesting film yesterday.

**12. Перепишите и переведите приводимые ниже предложения. Поставьте их в отрицательную форму. Задайте общий и специальный вопросы к каждому предложению.**

1.The Wilsons normally have breakfast at 7 o'clock. (When?) 2.Many people like to work in the garden. (Where?) 3.They went to the airport by car. (How?) 4.They chose books and magazines at the bookstall. (What?)

5.I shall know the result in a week. (When?) 6.He will buy a present to Mary for Christmas. (To whom?)

**13. Прочтите и устно переведите текст. Перепишите и письменно переведите 2-й абзац текста.**

### **Junction Transistors**

The junction transistor was one of the first types of transistor to come into commercial use, and many thousands are now used in electronic circuits. The junction transistor is a bipolar transistor, that is it employs both p-types and n-types semiconductor regions.

Early transistors were made from germanium, and were mainly of the p-n-p type. That is, they comprise a single crystal, which contains two p-regions and one n-region. One of the p-regions, known as an emitter, is of low resistivity material with a heavy impurity doping. The emitter is the source of charge carriers in the transistor. The central n-region is known as the base region of the transistor, and is a relatively pure\*\* semiconductor of high resistivity. The base region is the control electrode or control region of the transistor. The second p-region, known as the collector region, has a lower conductivity than the emitter region, and is the region in which the mobile charge carriers are finally collected.

With the development of silicon devices, p-n-p transistors have come into more common usage. In the n-p-n transistor, the two extreme n-regions are the emitter and collector, respectively, while the central p-region is the base region.

NOTES: \*junction transistor –плоскостной транзистор

\*\*pure – чистый, без примесей

### **Вариант 3**

**1. Вставьте в предложения глагол to be в форме единственного или множественного числа is/are.**

1.Our furniture ... getting old. 2.All my belongings ... in my bag. 3.Physics ... a compulsory subject at school. 4.Her jeans ... black. 5.Billiards ... played all over the world.

**2. Употребите в данных предложениях личные местоимения.**

1.That's my notebook. Can I have ... back, please? 2.Their tutor gives ... a lot of homework. 3.Look! This is a photo of ... with my friends. 4.Who's

that handsome man? I want to meet ... . 5. We want to talk with our cousin William, but he is tired. He doesn't want to speak with ... . 6. Are you free? I want to speak with ... .

**3. Заполните пропуски притяжательными местоимениями в простой или абсолютной форме.**

1. You don't have enough time to wash ... hair. 2. Our house is older than the Smiths'. ... is smaller though. 3. Thomas met ... wife at a college, but my wife is more intelligent than ... . 4. I am sorry, this is not my jacket, ... is brown. 5. It is cold in this room but in ... it is even worse. We are freezing. 6. Materials can be classified according to ... electrical properties.

**4. Перепишите и письменно переведите предложения, обращая внимание на перевод неопределенных местоимений и наречий.**

1. Nobody missed lectures last week. 2. We did not find this magazine anywhere. 3. He knew nothing about this discovery. 4. Something happened to my TV set. 5. Everybody in England is proud of their traditions. 6. No one in the laboratory could tell us about the results of the experiments. 7. Our professor told us about some interesting facts from his practical work.

**5. Напишите форму множественного числа от данных существительных:**

box, hero, shelf, foot, tooth, goose, pocket-knife, woman-servant, family, fish, postman

**6. Поставьте выделенные существительные во множественное число. Произведите все необходимые изменения.**

1. The *wife* of the *sailor* came to the shore. 2. The *story* is thrilling. 3. The *cargo* of the *steamer* consists of different raw materials. 4. There is a new *house* in our street. 5. He keeps his toys in the *box*. 6. Put this *knife* on the *table*.

**7. Перепишите данные ниже предложения. Определите по грамматическим признакам, какой частью речи является слово, оформленное окончанием -s, какую функцию это окончание выполняет, т.е. служит ли оно а) показателем 3л.ед.ч. в *Present Indefinite (Present Simple)*, б) признаком множественного числа существительного, в) показателем притяжательного числа имени существительного. Предложения переведите.**

1.A friend of mine studies at our University. 2.This young engineer's projects are very interesting. 3.Students do their practical work in well-equipped laboratories and studies. 4.He used the results of these analyses in his work. 5.Electricity lights our streets and houses. 6.Their institute houses both physical and chemical laboratories.

**8. Вставьте s, 's, s' вместо точек, где необходимо.**

1.There was a moment... silence between them. 2.We could not explain the young girl... behaviour at yesterday... dinner. 3.Bob... friend... live in his parent... house. 4.What was the car... number?

**9. Перепишите следующие предложения, содержащие разные формы сравнения, и переведите их на русский язык.**

1.The nearer is the summer, the longer are the days. 2.Winter in England is not so cold as it is in our country. 3.This new device operates several times faster than your old one. 4.To study well is as important as to work well. 5.The hottest days are in summer.

**10. Раскройте скобки и поставьте прилагательные в нужную степень.**

1.It is (bad) paper you have ever given me. 2.Cold weather is (pleasant) than wet weather. 3.Who is (happy) man in the world? 4.A car is (expensive) than a bicycle. 5.How can I get to the (near) post-office? 6.Hunger is the (good) cook.

**11. Перепишите данные предложения, определите в них видо-временные формы глагола и укажите их инфинитив. Предложения переведите.**

1.There were two universities in England in the early 13<sup>th</sup> century – Oxford and Cambridge. 2.They usually buy newspapers in the morning. 3.For a long time London University had no library. 4.The students will take an active part in the preparation for the conference. 5.My friend attends lectures, classes and seminars at the University three times a week.

**12. Перепишите и переведите приводимые ниже предложения. Поставьте их в отрицательную форму. Задайте общий и специальный вопрос к каждому предложению.**

1.We usually do the shopping on Thursday. (What?) 2.Charles goes to the disco every Saturday. (How often?) 3.She gave him some medicine.

(Whom?) 4.The train started at 9 o'clock. (When?) 5.We shall go to the theatre with Mary. (With whom?) 6.You will come here next month. (Where?)

**13. Прочтите и устно переведите текст. Перепишите и письменно переведите 3-й абзац текста.**

### **Semiconductors**

A semiconductor is often defined as an electrical conductor that has a conductivity intermediate between that of an insulator and that of a metal. Some of the properties, which we now associate with semiconductors, have been known for a century or more. Little use was made of these properties, however, until the first decade of the last century, when practical semiconductor detectors were developed for radio reception.

Engineers and scientists turned their attention to semiconductors more than 40 years ago. They saw in them a means of solving an old engineering problem, namely, that of direct conversion of heat into electricity without boilers or machines.

The most important among the semiconductor devices, the transistors, were invented in 1948. Their invention and development resulted in the expanded use of semiconductor devices of all kinds. Semiconductor devices can usually perform all the elementary functions of oscillation, amplification, modulation and demodulation, rectification, etc. with greater economy of cost, space, and power, than can other devices such as vacuum tubes and relays. Semiconductor devices are used in measuring techniques, automatics, computers, radio and TV sets. A new industry – helioengineering\* - has appeared. Solar batteries are successfully operating on sputniks and spaceships.

NOTES: \* helioengineering – гелиотехника



## КОНТРОЛЬНОЕ ЗАДАНИЕ № 2 RADIO ENGINEERING

Для правильного выполнения Задания № 2 необходимо усвоить следующие разделы грамматики английского языка по любым учебникам:

1. Видо-временные формы глагола:

А) активный залог (*The Active Voice*) для форм *Continuous (Present, Past, Future)* и *Perfect (Present, Past, Future)*

Б) пассивный залог (*the Passive Voice*) для формы *Indefinite (Present, Past, Future)*

Особенности перевода на русский язык пассивного залога английских глаголов, имеющих предложное дополнение или дополнение без предлога.

2. Модальные глаголы и их эквиваленты:

А) модальные глаголы *can (could), may (might)*, выражающие возможность, и эквивалент модального глагола *can – to be able*

Б) модальный глагол *must*, выражающий долженствование, и его эквиваленты *to be to, to have to*

В) модальные глаголы *should, ought (следует), needn't (нет необходимости)*

3. Простые неличные формы глагола *Participle I (Present Participle)* и *Participle II (Past Participle)* в функции определения и обстоятельства.

После изучения всего указанного выше материала можно приступить к выполнению задания.

### ТЕКСТЫ ДЛЯ ИЗУЧАЮЩЕГО ЧТЕНИЯ, ПЕРЕВОДА И ЗАКРЕПЛЕНИЯ ГРАММАТИКИ

#### Text 2(A) Fundamentals of Radio

Radio transmission and reception was perhaps one of the earliest applications of electronics, the application that made the greatest impact on society. Surprisingly enough, we can use radio, predict its properties and design circuits that work very efficiently, but we know little about the real nature of radio. Ask an electronic engineer what radio is, and the answer

will be a confident “electromagnetic waves” Ask a physicist what electromagnetic waves are, and he will tell you that really we do not know.

We do know that electromagnetic radiation is a form of energy, and that it is propagated as waves. The model became more of a model and less like reality when we discover that radio travels through vacuum. One has to understand how can there be waves in a vacuum. Perhaps in the future, theoretical physics will give us an answer.

Possibly the hardest concept to understand radio is the way in which circuits can broadcast or communicate radio waves.

As to communication it is a process of conveying intelligence from one point to another by radio.

At the start, and also at the end of the communication process radio technique is identical with that of wire telephony and telegraphy. Radio differs from other methods of communication in the means used to connect the transmitting and receiving points.

As we have already mentioned that the science of radio is centered round electromagnetic fields or waves. In fact, the term “radio” has been driven from “radiation” – the process of propagating or sending the waves into space.

The basic elements of any system of radio communication are: a transmitter and a receiver, a transmitting and a receiving antenna, a modulator, a cathode-ray tube, a relay, headphones, a loudspeaker, etc.

### **Text 2 (B) Radio Waves**

Radio waves are electromagnetic waves used for radio-communication. According to their frequencies electromagnetic waves produce different effects and are generated and detected by different methods. The waves of highest frequency so far discovered are cosmic rays, which appear in interstellar space and reach the earth from all directions. Next in order down the frequency spectrum come X-rays, ultra-violet rays and ordinary light space, to be followed by infrared rays and radio waves. The frequencies of radio waves are too low to be perceived<sup>1</sup> by the eye, although they are of exactly the same type as light waves, which operate on higher frequencies. Because of their low frequency, radio waves have to be collected on an aerial system and made perceptible by converting them to sound or vision. They have a great advantage over other forms of communication in that they follow the curvatures<sup>2</sup> of the earth and so are suitable<sup>3</sup> for communication over great distances.

NOTES: <sup>1</sup> to perceive – воспринимать; <sup>2</sup> curvature –искривление; <sup>3</sup> suitable –подходящий, соответствующий

**Text 2 (C) Basic Receivers and Transmitters**

A much simplified transmitter block-diagram is shown in Fig. 1. This could be called the all-purpose block-diagram since it could be easily converted to a low-level or high-level amplitude modulation transmitter, a single sideband transmitter, or a frequency modulation transmitter. Obviously in the example, the circuit details would vary greatly, particularly in the modulators, and if detailed block diagrams were drawn the underlying similarities in structure would be less obvious.

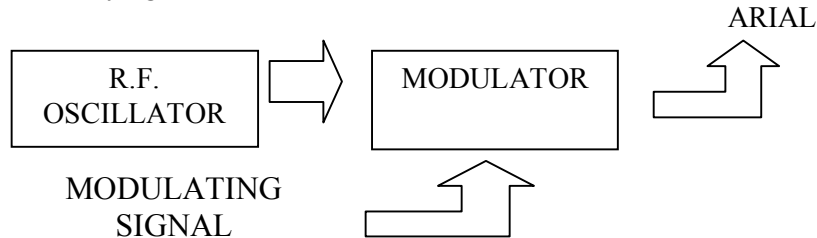


Fig.1. Basic radio transmitter block-diagram

The basic type of a receiver is a tuned radio frequency, however, this is rarely used. The standard receiver configuration is the superheterodyne (superhet) shown in Fig.2.

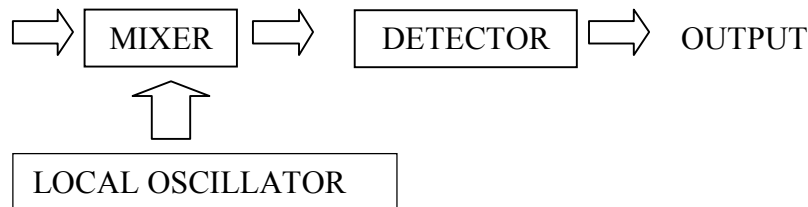


Fig.2. Basic superheterodyne receiver block-diagram

The desired radio frequency (r.f.) is converted to a constant intermediate frequency by taking the difference frequency after mixing the received signal with the output from a local oscillator. Since most of the amplification and selectivity is provided by constant frequency and bandwidth stages, the design problem is eased.

In both the transmitter and the receiver, r.f. oscillators have to be tuned to different frequencies. In the transmitter it is the master oscillator, while

in the receiver it is the local oscillator. Modern practice is to use a frequency synthesizer with a single crystal to provide stability and accuracy.

### **Text 2 (D) Current and Future Developments of Radio Systems**

Changes in aircraft radio systems occur more and more frequently. The first airborne radio equipment<sup>1</sup> used thermionic devices<sup>2</sup>, cat's whisker detectors<sup>3</sup> and large parallel plate tuning capacitors<sup>4</sup>; power, weight and size were restrictions on the development of such equipment. In the 1950s transistorized equipment began to appear although not completely transistorized. Even now thermionic devices are still with us in the shape of the magnetron and the cathode-ray tube. Claims concerning all solid-state weather radars were made about mid-1979, and commercially available equipment appeared in 1980. The cathode-ray tube will remain with us for many years but will eventually be replaced by a matrix of electroluminescent elements.

Transistorized equipment is, of course, still marketed, but many of the transistors, diodes and resistors now appear on integrated circuits. The emergence of integrated circuits has revolutionized the design of air radio systems. The use of IC techniques to produce microprocessors has opened up a new world. Increased safety, increased payload, increased reliability and improvement in performance allow flights to be made in conditions where previously aircraft have to be grounded. Completely new systems do not appear very frequently, although when they do, it is often because the improvement in the state of the art made the impossible possible.

NOTES: <sup>1</sup>airborne radio systems – бортовое радиооборудование; <sup>2</sup>thermionic devices - термоэлектронные устройства; <sup>3</sup>cat's whisker detectors – детекторы (датчики) с нитевидным кристаллом; parallel plate tuning capacitors – конденсатор настройки с параллельными анодами

## **Контрольная работа № 2**

### **Вариант 1**

**1. Перепишите предложения; подчеркните в каждом глагол-сказуемое и определите его видо-временную форму и залог. Переведите предложения на русский язык. В разделе (Б) обратите**

внимание на особенности перевода конструкций со страдательным залогом, в разделе (B) – на место предлога в русском языке.

Образец: *were agreed upon – Past Ind. (Simple) Passive* от глагола *to agree*

(A) 1. While engineers were testing a new high-frequency device the power supply was suddenly interrupted. 2. A number of investigations has shown that the poles of the Earth's magnetic field have reversed many times. 3. When the user gets into trouble, he can discover by reading the instruction book what he is doing wrong. 4. Russian astronomers have concluded that the Earth is hit by cosmic bodies as often as the Moon. 5. A new welding machine will be put into operation next week.

(B) 1. A subroutine may be used many times during the computation of a programme but is written only once in the whole programme. 2. A computer must be told what operation to perform by means of instructions. 3. The students were shown a flow chart, which was very helpful for understanding interrelationship between various parts of a code. 4. We hope that during the discussion we'll be offered some new ways of solving this problem. 5. He was promised immediate help.

(B) 1. No special attention was paid to the early period of this scientist's activity. 2. His remark wasn't taken notice of. 3. He would like to read the article referred to by the professor. 4. The decision insisted upon could not be accepted. 5. The lecture was followed by a discussion.

**2. Заполните пустые графы таблицы номерами соответствующих предложений:**

Время	Характеристика действия (вид)		
	Простое (неопределенное)	Длительное (продолженное)	Завершенное
Настоящее	1,		
Прошедшее			
Будущее			

(A) 1. Я занимаюсь каждый день. 2. Я занимаюсь сейчас. 3. Я уже выучил уроки сегодня. 4. Я занимался английским вчера. 5. Я занимался английским, когда он пришел. 6. Я уже выучил первый

урок, прежде чем начал второй. 7.Завтра я буду заниматься. 8.Я буду заниматься, когда вы придете. 9.Я уже выучу первый урок, перед тем как начну изучать второй.

(Б) 10.I was studying when they came. 11.I shall (I'll) have studied Lesson Six when I start Lesson Seven. 12.I have already studied Lesson One.13.I study every day. 14.I shall be studying when you come. 15.I am studying now. 16.I studied yesterday. 17.I shall study tomorrow. 18.I had studied Lesson One before I began to study Lesson Two.

**3. Определите, какой английской форме глагола соответствует данный русский перевод (например, 1г, 2д и т.д.):**

- |                    |                                   |
|--------------------|-----------------------------------|
| 1. write           | а) пишу (сейчас)                  |
| 2. am writing      | б) писал (вчера)                  |
| 3. have written    | в) напишу (завтра)                |
| 4. wrote           | г) написал (уже)                  |
| 5. was writing     | д) буду писать (когда ты придешь) |
| 6. will write      | е) пишу (регулярно)               |
| 7. will be writing | ж) писал (когда ты пришел)        |

**4. Перепишите и переведите предложения. Поставьте их в отрицательную форму. Задайте общий и специальный вопросы к каждому предложению.**

1.She is having an English lesson now. (What lesson?) 2.They are translating a very interesting article. (What?) 3.She is listening to the news. (Who?) 4.I have just received a letter from my friend. (From whom?) 5.He has already been to London for three times. (How many times?) 6.She has just gone to the lecture. (Where?) 7.My mother was reading a book all the evening yesterday. (At what time?) 8.I was writing a report at this time yesterday. (Who?) 9.The doctor was examining the patients at 10 o'clock in the morning. (Whom?)

**5. Выберите правильную форму глагола.**

1. We \_\_\_ five days a week. (work, worked, are working)
2. We \_\_\_ them next weekend. (visited, shall visit, have visited)
3. When he came, they \_\_\_ dinner. (will have, had, were having, had had)
4. \_\_\_ you meet her at the station? (Does, Did, Have)
5. I \_\_\_ all my exams in June. (have passed, passed, is passing)
6. I \_\_\_ not heard this news. (did, have, will)

7. The rain \_\_\_ before we reached home. (stopped, has stopped, had stopped)

8. I \_\_\_ not \_\_\_ your book today. (have brought, had brought, brought)

9. \_\_\_ I help you? (Has, Have, Shall)

**6. Завершите разделительный вопрос, выбрав правильный вариант.**

1) I shall get up very early tomorrow, \_\_\_\_\_ ?  
shall I  
shan't I  
can't I  
don't I

2) You have built your house, \_\_\_\_\_ ?  
aren't you?  
don't you?  
haven't you?

**7. Перепишите предложения; подчеркните в них причастие I (Participle I) и причастие II (Participle II) и укажите, являются ли оно определением, обстоятельством или составной частью глагола-сказуемого. Предложения переведите.**

1. If used economically, these fuel supplies could last for a month. 2. When performing the problem in mathematical practice, the students of our university use computers. 3. The problem discussed aroused interest. 4. The falling snow makes the landscape picturesque. 5. The question remained unanswered. 6. Having booked a ticket I went to the post office to send a telegram. 7. The experiment made gave good results. People studying foreign languages can acquire good knowledge if they have regular conversational practice. 8. The students are writing a test at the moment. 9. They were asked what methods the scientists used during the experiment. 10. Not knowing about their arrival I could not meet them at the airport.

**8. Перепишите и письменно переведите следующие предложения; подчеркните в них модальные глаголы или их эквиваленты.**

1. One object may be larger than another one, but it may weigh less. 2. Mass can also be defined as a measure of inertia. 3. Man-made satellites had to use solar cells as a source of power. 4. Plastics should be reinforced by different kinds of fibers. 5. The method that is to be used in this case is rather complicated.

**9. Выберите правильный модальный глагол:**

1. He \_\_\_ speak three foreign languages. (can, may, must)
2. He \_\_\_ be in the room. (is, must, has)
3. The sky is dark. It \_\_\_ rain soon. (may, should, has to)
4. The weather \_\_\_ change tomorrow. (may, must, should)
5. \_\_\_ you help me? (could, should, must)

**10. Выберите правильный вариант ответа:**

1. Must I come tomorrow? – No, you \_\_\_\_. (mustn't, can't, needn't)
2. May I invite my friend to the party? – Yes, you \_\_\_\_. (can, must, may)

**11. Определите, в каком предложении глагол *to be* является модальным.**

1. She is a secretary.
2. She is working.
3. She is to start work at 9 a.m.

**12. Завершите варианты (b) и (c):**

- 1) (a) *They can buy tickets to the theatre.*  
(b) \_\_\_\_\_ tickets to the theatre?  
(c) They \_\_\_\_\_ not \_\_\_\_\_ tickets to the theatre.
- 2) (a) *She has to get up early on week-days.*  
(b) \_\_\_ she \_\_\_ early on week-days?  
(c) She \_\_\_\_\_ not \_\_\_\_\_ early on week-days.

**13. Соотнесите английские предложения с русскими (например, 1А, 2С и т.д.):**

- |                               |                             |
|-------------------------------|-----------------------------|
| 1. She may come.              | а. Ей можно не приходить.   |
| 2. She couldn't come.         | б. Ей можно прийти.         |
| 3. She must come.             | в. Ей не следует приходить. |
| 4. She had to come.           | г. Она должна прийти.       |
| 5. She shouldn't come.        | д. Она не могла прийти.     |
| 6. She'll be able to come.    | е. Она сможет прийти.       |
| 7. She needn't come.          | ж. Ей не разрешают прийти.  |
| 8. She isn't allowed to come. | з. Ей пришлось прийти.      |



## Вариант 2

1. Перепишите предложения; подчеркните в каждом глагол-сказуемое и определите его видо-временную форму и залог. Переведите предложения на русский язык. В разделе (Б) обратите внимание на особенности перевода конструкций со страдательным залогом, в разделе (В) – на место предлога в русском языке.

*Образец: were agreed upon – Past Ind. (Simple) Passive от глагола to agree*

(A) 1. We have seen that the collector current is equal to the emitter current. 2. Integrated circuits are rapidly replacing transistors, diodes, resistors and capacitors. 3. The frequency of collisions between the atoms and electrons will be increasing when a greater number of electrons is present. 4. Radio astronomy has given mankind efficient means for penetrating into space. 5. The kind of electrolyte used had had no effect on the electromotive force.

(Б) 1. The term integrated circuit is used to describe a group of electronic elements connected together. 2. The test will be finished in two weeks. 3. Synthetic rubber products were developed between 1914 and the 1930s. 4. Heat energy is being used in many branches of industry now. 5. Energy is involved in any motion and in any event.

(В) 1. The achievements in the field of radioelectronics were much written about. 2. The problem concerning the work of superheterodyne receiver will be further worked at. 3. The operation of semiconductor devices is affected by temperature. 4. As these electrons are loosely bound to the atom, they are spoken of as free electrons. 5. The reverse current is influenced by the rate of change of applied voltage.

2. Заполните пустые графы таблицы номерами соответствующих предложений:

Время	Характеристика действия (вид)		
	Простое (неопределенное)	Длительное (продолженное)	Завершенное
Настоящее	1,		
Прошедшее			
Будущее			

(А). 1.Я смотрю телевизор по вечерам. 2.Где твой брат? – Он в гостиной смотрит телевизор. 3.Вчера я не смотрела телевизор, так как была занята. 4.Я только что посмотрела эту программу. 5.Я смотрела телевизор, когда вошла мать.

(Б) 6.He was at the front during the war. 7.I am reading a book at the moment. 8.He hasn't eaten anything for 24 hours. 9.The train will have left by this time tomorrow. 10.I'll remember this day all my life. 11.I saw your brother yesterday. 12.They were discussing the plan of our work at the meeting. 13.After the sun had set we went home. 14.He plays chess well. 15.I have just met him. 16.Someone is knocking at the door. 17.It was raining yesterday. 18.He doesn't like fish for dinner.

3. Определите, какой английской форме глагола соответствует данный русский перевод (например, 1г, 2ж и т.д.):

- |                    |                                   |
|--------------------|-----------------------------------|
| 1. read            | а) читаю (сейчас)                 |
| 2. am reading      | б) читал (вчера)                  |
| 3. have read       | в) прочту (завтра)                |
| 4. read            | г) прочитал (уже)                 |
| 5. was reading     | д) буду читать (когда ты придешь) |
| 6. will read       | е) читаю (регулярно)              |
| 7. will be reading | ж) читал (когда ты пришел)        |

4. Перепишите и переведите предложения. Поставьте их в отрицательную форму. Задайте общий и специальный вопрос к каждому предложению.

1. John is ringing to say good-bye. (Why?) 2. I have lost the key. (What?) 3. I had already written the letter when my brother came. (When?) 4. When the

boy was playing in the yard he suddenly saw a strange man. (Who?) 5.I shall be translating this text at 5 o'clock tomorrow. (What?) 6.John will have translated all the articles by 10 o'clock. (By what time?) 7.We have had terrible weather since Monday. (Since when?) 8.I hope you are not waiting long. (How long?) 9.When I was walking home I saw an old friend of mine. (Where?)

**5. Выберите правильную форму глагола.**

- 1.She \_\_\_ in the suburbs of St. Petersburg. (lives, lives, has lived)
- 2.What \_\_\_ she doing now? (is, does, has)
- 3.He \_\_\_ school two years ago. (finished, has finished, had finished)
4. \_\_\_ she cooked breakfast already? (does, is, has)
- 5.I \_\_\_ my exams and can have a good time now. (have passed, passed, am passing)
- 6.She \_\_\_ not marry him. (was, have, did)
- 7.The taxi \_\_\_ by the time the guests came. (arrived, had arrived, was arriving)
8. \_\_\_ you \_\_\_ the dinner by 5 o'clock? (have cooked, had cooked, will have cooked)
- 9.I \_\_\_ not seen you for ages. (has, have, shall)

**6. Завершите разделительный вопрос, выбрав правильный вариант.**

- 1) He has taken his examinations this winter, \_\_\_\_\_?  
has he?  
doesn't he?  
hasn't he?  
will he?
- 2) You went to the stadium with him, \_\_\_\_\_?  
don't you?  
didn't you?  
won't you?  
wasn't you?

**7. Перепишите предложения; подчеркните в них причастие I (Participle I) и причастие II (Participle II) и укажите, являются ли оно определением, обстоятельством или составной частью глагола-сказуемого. Предложения переведите.**

1.The letter posted was not delivered in time. 2.Lying the table, don't forget to put forks and knives properly. 3.Not knowing what to do I decided to stay home. 4.Journalists taking part in the conference are admitted by a special pass. 5.They carried out the experiment using the best computer programs. 6.Who is this smiling girl? 7.Having passed the exams he went to Japan.8. She was walking slowly stopping sometimes to have a short rest. 9.He has already done all the work. 10.The work being finished, we went home.

**8. Перепишите и письменно переведите следующие предложения; подчеркните в них модальные глаголы или их эквиваленты.**

1.The most fundamental law in physics states that energy can neither be created nor destroyed. 2.Amorphous semiconductors may possibly find a technical application for solar cells. 3.He must find this article: its subject is closely connected with his work. 4.The history of the silicon solar cell began in 1954. A large-scale application, however, had to wait until the advent of the space age three years later. 5.You are to apply the mean value of the voltage, no matter which device you use. 6.The student should be able to define basic theoretical principles.

**9. Выберите правильный модальный глагол:**

1. You \_\_\_ work hard at your English if you want to know it. (can, may, must)  
2. You feel bad, you \_\_\_ see a doctor. (needn't, should, can)  
3. The lights are on. They \_\_\_ be at home. (may, must, are to)  
4. She \_\_\_ to finish school in a year. (may, has, is)  
5. I'm afraid the weather \_\_\_ change for the worse. (must, may, should)  
6. When this scientist was 21 years old he \_\_\_ solve a very important mathematical problem. (could, was able to, had to)

**10. Выберите правильный вариант ответа:**

1) Must I visit the doctor today? – No, you \_\_\_\_\_. (mustn't, can't, needn't)  
2) May I take one of your books for a week? – Yes, you \_\_\_\_\_. (can, may, must)

**11. Определите, в каком предложении глагол *to have* является модальным.**

1. She has a lot of work today. 2. She has to do a lot of work today. 3. She has done a lot of work today.

**12. Завершите варианты (b) и (c):**

- 1) (a) *She had to visit her parents last Sunday.*  
(b) \_\_\_\_\_ she \_\_\_\_\_ her parents on Sunday?  
(c) She \_\_\_ not \_\_\_ visit her parents on Sunday.
- 2) (a) *You can go to the theatre with your friend.*  
(b) \_\_\_ I \_\_\_\_\_ to the theater with my friend?  
(c) You \_\_\_\_\_ not \_\_\_\_\_ to the theater with your friend.

**13. Соотнесите английские предложения с русскими (например, 1а, 2с и т.д.):**

- |                              |                                |
|------------------------------|--------------------------------|
| 1. She may ask.              | а. Ей можно не спрашивать.     |
| 2. She couldn't ask.         | б. Ей можно спросить           |
| 3. She mustn't ask.          | в. Ей не следует спрашивать.   |
| 4. She had to ask.           | г. Она не должна спрашивать.   |
| 5. She shouldn't ask.        | д. Она не могла спросить.      |
| 6. She won't be able to ask. | е. Она не сможет спросить.     |
| 7. She needn't ask.          | ж. Ей не разрешают спрашивать. |
| 8. She isn't allowed to ask. | з. Ей пришлось спросить.       |

**Вариант 3**

**1. Перепишите предложения; подчеркните в каждом глагол-сказуемое и определите его видо-временную форму и залог. Переведите предложения на русский язык. В разделе (Б) обратите внимание на особенности перевода конструкций со страдательным залогом, в разделе (В) – на место предлога в русском языке.**

*Образец: were agreed upon – Past Ind. (Simple) Passive от глагола to agree*

(A) 1. Amplifiers have played a great role in most electronic devices. 2. The article was describing the main features of some semiconductor device. 3. A new type of transistor will be consuming practically no power from the tested circuit. 4. The Mendeleyev system has served for almost 100 years as a key to discovering new elements.

(Б) 1.The rise and fall of the current pulses are affected to some extent by almost every circuit element. 2.The first sputnik was launched into space in 1957. 3.These elements will be transformed into other elements during the next stage of the experiment. 4.In this paper new experimental observations were presented. 5.The relationship between the computers and the people that use them will be described in all the details.

(Б) 1.The experiment carried out by these researchers can be relied upon. 2.Some amplification was obtained by using tuned r-f amplifier ahead of the mixer. 3.The discovery of electron was followed by investigations of its properties. 4.The amplifying characteristics of a new type of transistor will be referred to as<sup>1</sup> reverse saturation current.

NOTES: <sup>1</sup> to be referred to as – называться

**2. Заполните пустые графы таблицы номерами соответствующих предложений:**

Время	Характеристика действия (вид)		
	Простое (неопределенное)	Длительное (продолженное)	Завершенное
Настоящее			1
Прошедшее			
Будущее			

(А) 1.Я уже посмотрела этот фильм, когда пришел отец. 2.Я посмотрю фильм к тому времени, когда придет мой друг. 3.Завтра по телевизору интересная передача. Я буду обязательно смотреть ее. 4.Завтра в полдень я буду смотреть телевизор. 5.Я не смотрю телевизор по будням, так как я возвращаюсь с работы слишком поздно.

(Б) 6.I knew that long ago. 7.I'm working at my project now. 8.The students will have discussed the problem before the teacher comes. 9.You will be watching TV at 5 o'clock tomorrow. 10.He'll come again next year. 11.He lived in Siberia during the war. 12.The car had nobody in but the engine was running. 13.He had lived in Kiev before he married Susan. 14.I usually have breakfast at 8 o'clock. 15.Do you hear what they are talking

about? 16. I haven't spoken to him yet. 17. I was translating the article from 5 till 7 o'clock. 18. It rained yesterday.

**3. Определите, какой английской форме глагола соответствует данный русский перевод (например, 1г, 2е и т.д.):**

- |                    |                               |
|--------------------|-------------------------------|
| 1. wait            | а) жду (сейчас)               |
| 2. am waiting      | б) ждал (вчера)               |
| 3. have waited     | в) буду ждать (завтра)        |
| 4. waited          | г) прождал (уже)              |
| 5. was waiting     | д) подожду (когда ты придешь) |
| 6. will wait       | е) жду (регулярно)            |
| 7. will be waiting | ж) ждал (когда ты пришел)     |

**4. Перепишите и переведите предложения. Поставьте их в отрицательную форму. Задайте общий и специальный вопрос к каждому предложению.**

1. They are watching TV in the next room. (Where?) 2. I shall have written the letter by 3 o'clock tomorrow. (By what time?) 3. Yesterday at 10 o'clock I was returning home. (When?) 4. She had learned to speak English by the end of the year. (What language?) 5. I shall have translated the text before the bell. (Who?) 6. It'll be raining tomorrow morning. (When?) 7. I have known that for a long time. (How long?) 8. I had lived in Moscow before I went to St. Petersburg. (Where?) 9. He has been very ill since last month. (Since when?)

**5. Выберите правильную форму глагола.**

1. They \_\_\_ their parents every weekend. (visited, shall visit, is visiting)
2. Look out of the window. It \_\_\_ hard. (rains, will rain, is raining)
3. I \_\_\_ in the garden last Sunday. (worked, have worked, had worked)
4. \_\_\_ the guests dancing when you came? (does, have, were)
5. I \_\_\_ my exams in June and go to the seaside with you. (have passed, passed, shall pass)
6. We \_\_\_ her at the Institute yesterday. (saw, have seen, will see)
7. \_\_\_ the delegation visit your school? (did, has, had)
8. I \_\_\_ not known the truth before she told me. (has, had, shall)
9. \_\_\_ you meet your friend at the airport? (does, did, have)

**6. Завершите разделительный вопрос, выбрав правильный вариант.**

1) Mother is watching TV, \_\_\_\_\_?  
isn't she?  
doesn't she?  
wasn't she?

2) They had cleaned the house before your arrival, \_\_\_\_\_?  
didn't they?  
hadn't they?  
aren't they?

**7. Перепишите предложения; подчеркните в них причастие I (*Participle I*) и причастие II (*Participle II*) и укажите, являются ли оно определением, обстоятельством или составной частью глагола-сказуемого. Предложения переведите.**

1.The lecture delivered caused discussion. 2.Having left Moscow and lived in the North for a year, I felt homesick. 3.Being asked in Spanish I could not understand what I was asked. 4.There is a growing demand for information. 5.Telegrams sent at nighttime must be paid less. 6.The girl speaking to your friend is my sister. 7.Arriving at the station I rang up a manager. 8.If asked he would explain everything. 9.They have seen this film before. 10.I took the newspaper, which was lying on the table.

**8. Перепишите и письменно переведите следующие предложения; подчеркните в них модальные глаголы или их эквиваленты.**

1.Electric power may be used in practically all technical processes and turned into all other forms of energy. 2.To make an electric current flow continuously along a wire, a continuous supply of electrons must be available at one end and a continuous supply of positive charges at the other. 3.In flight the pilot has to know and report his position. 4.In our experiments we are to compare the two semiconductors. 5.Nowadays we cannot imagine modern engineering without semiconductors. 6.One should keep in mind that the hole is actually a missing valence electron.

**9. Выберите правильный модальный глагол:**

1.You \_\_\_ not go out, the lesson is not over yet. (can, may, must)  
2.I \_\_\_ walk, there is a bus going there. (needn't, should not, can't)  
3.You \_\_\_ to come here again. (must, should, have)



4. The weather is cold, you \_\_\_ swim. (can, can't, must)
5. Somebody will \_\_\_ to meet her. (ought, need, have)
6. To solve a problem a computer \_\_\_ have a way of accepting data. (is to, must, could)

**10. Выберите правильный вариант ответа:**

1. Must I speak about the results of the experiment at the conference? – No, you \_\_\_ (mustn't, can't, needn't)
2. May I go to the dancing party with Nick? – Yes, you \_\_\_. (can, may, must)

**11. Определите, в каком предложении глагол *to be* является модальным.**

1. She was sixteen last year.
2. The delegation is to arrive on Monday.
3. What are you doing?

**12. Завершите варианты (в) и (с):**

- 1) (a) *Police must work on holidays in the USA.*  
(b) \_\_\_\_\_ on holidays in the USA?  
(c) \_\_\_\_\_ not \_\_\_\_\_ on holidays in the USA.
- 2) (a) *They have to start work at 7 o'clock in the morning.*  
(b) \_\_\_\_\_ they \_\_\_\_\_ work at 7 o'clock in the morning?  
(c) They \_\_\_\_\_ not \_\_\_\_\_ work at 7 o'clock in the morning.

**13. Соотнесите английские предложения с русскими (например, 1а, 2е и т.д.):**

- |                              |                              |
|------------------------------|------------------------------|
| 1. She may ask.              | а. Ей можно не спрашивать.   |
| 2. She couldn't ask.         | б. Ей можно спросить.        |
| 3. She must ask.             | в. Ей не следует спрашивать. |
| 4. She had to ask.           | г. Она должна спросить.      |
| 5. She shouldn't ask.        | д. Она не могла спросить.    |
| 6. She'll be able to ask.    | е. Она сможет спросить.      |
| 7. She needn't ask.          | ж. Ей не разрешают спросить. |
| 8. She isn't allowed to ask. | з. Ей пришлось спросить.     |

## Второй год обучения

### КОНТРОЛЬНОЕ ЗАДАНИЕ № 3 COMPUTERS

Для того чтобы правильно выполнить Задание №3, необходимо усвоить следующие разделы грамматики английского языка по любым учебникам и учебным пособиям:

1. Пассивные формы (*Passive Voice*) глагола в трех временных группах – *Indefinite, Continuous, Perfect*. Страдательный залог с модальными глаголами.
2. Многочисленность глаголов *to be, to have, to do*.
3. Неличные формы глагола: инфинитив (*Infinitive*) герундий (*Gerund*)

Отличие герундия от причастия настоящего времени (*Participle I*).

4. Основные правила согласования времен. Перевод на русский язык главных и придаточных предложений при согласовании времен.
5. Прямая и косвенная речь. Перевод из прямой речи в косвенную.

После изучения всего указанного выше материала можно приступить к выполнению задания.

#### ТЕКСТЫ ДЛЯ ИЗУЧАЮЩЕГО ЧТЕНИЯ, ПЕРЕВОДА И АКТИВИЗАЦИИ ГРАММАТИЧЕСКОГО МАТЕРИАЛА.

##### Text 3 (A). What is Computing?

Suppose you sit down with pencil and paper and center your attention on adding figures. You add first all the digits in the right-hand column, then all the digits in the next column, and so on – until you finally arrive at the answer<sup>1</sup>. When you do this, you are computing.

When you stop at a street corner, looking first to the left for any coming car, then to the right, to cross the street or to wait on the sidewalk<sup>2</sup>– you are computing.

When you are walking along a poorly marked path<sup>3</sup> in the woods, thinking if you are really on the path or have lost it<sup>4</sup>– you are computing.

When you are taking in information or data, performing reasonable operations (mathematical or logical) on the data, and are producing one or more answers – you are computing.

A machine can also do this. It can take in information or data, perform a sequence of reasonable operations (последовательность разумных операций) on the information, which it has received, and put out answers. When it does this, it is computing.

A very simple example of a computer is the ordinary business adding machine which prints on paper tape the number entered into its keyboard, and also prints a total when you press the total key. A complex example of a computer is a modern automatic digital computer, which in each second can perform more than 100,000,000,000 additions, subtractions, multiplications, or divisions.

A computing machine can take in and store information because the hardware inside the machine expresses arithmetical and logical relations, such as adding or subtracting, comparing or selecting. A computer can also put out information, display the answers when it receives them. Hardware is useless without software, which is computer instructions and programs.

The modern computers are of three kinds called analog, digital, and hybrid. An analog computer computes by using physical analogs of numerical measurements. A digital computer computes by using numbers (digits) and yes's and noes expressed usually in 1's and 0's<sup>5</sup>. A hybrid computer is a machine, which combines some of the properties of digital and analog computers.

NOTES:

<sup>1</sup> until you finally arrive at the answer – до тех пор, пока вы наконец не получите ответ

<sup>2</sup>a sidewalk – тротуар

<sup>3</sup>a poorly marked path – едва заметная тропинка

<sup>4</sup> if you are really on the path or have lost it – действительно ли вы находитесь на тропинке или заблудились

<sup>5</sup> yes's and noes expressed usually as 1's and 0's – да и нет, выраженных обычно единицами и нулями

### **Text 3 (B). Electronic Computers**

In the early 1940s the electronic computer was made with the mechanical Relays replaced by vacuum tubes. These were, however, single-purpose computers designed to aid in the war effort.<sup>1</sup>

The first general-purpose electronic computer was ENIAC (Electronic Numeric Integrator and Calculator) that was put into operation at the University of Pennsylvania in 1946 – a 30-ton machine that contained over 17,000 vacuum tubes and performed 100,000 operations per second (1 000

Kilohertz, or kHz), 1 000 times slower than today's mega hertz (MHz) chips.

With the invention of transistors in 1948, vacuum tubes that generated a great amount of heat were replaced by small transistors that functioned perfectly as switches<sup>2</sup> and generated little heat.

By 1953 there were only about 100 computers in the entire world. They were huge expensive machines. It was hard to imagine that one day machines that were hundreds of times smaller and thousands of times more powerful would occupy most homes and offices.

NOTES: <sup>1</sup> to aid in the war effort - для помощи в военных действиях;

<sup>2</sup> switches - переключатели

### **Text 3 (C). Personal Computers**

The first integrated circuit for computers was developed in 1958. Only in 1971 was the microprocessor that contained all the basic elements of a computer on a single chip introduced, followed by desktop computers in the mid-1970s.

Early computers were built as single-purpose machines, that is, they were built for performing a specific task. The first general-purpose ENIAC built in 1946 was programmable, but changing a program required rewiring<sup>1</sup> the machine!

The micromini computers of the 1970s and most in the 1980s followed the same pattern<sup>2</sup> and required extensive knowledge of common codes and function keys.

Apple Computer's Macintosh revolutionized the personal computer industry with a new machine. The user no longer has to memorize an operating system command for loading a program or file. Icons or small graphic images that can be selected with a mouse or other pointing device represent programs, functions, and files.

NOTES: <sup>1</sup> rewiring – перепрошивать;

<sup>2</sup> followed the same pattern – следовали тому же образцу

### **Text 3 (D). Part of Computer System**

In order to use computers effectively to solve problems computer systems are devised. Computer systems may be discussed in two parts.

The first part is hardware – the physical, electronic, and electromechanical devices that are thought of and recognized as “computers”. The hardware consists of the Central Processing Unit (CPU), input devices and output devices. The CPU is made up of a processor and a main memory, or main store. The processor carries out, or executes, instructions in the program. The main memory stores input data and the program needed by the processor. The main memory also holds output data, or the results of processing.

Input devices are used to provide data for the CPU. The keyboard is a common data input device. By using a keyboard, a user can enter data directly into the computer system. Data is sometimes entered on cards or it is often input from a mass storage device, such as magnetic tape or magnetic disk. A mass storage device has a much larger capacity than main memory. That is, it can store more data. The tapes or disks are read by an input device called a tape drive or a disk drive.

Output devices receive data from the CPU. The Visual Display Unit (VDU) and printer are common output devices. The VDU is similar to a TV screen. The printer produces printed output on paper. Both the VDU and printer present output data for immediate use. Sometimes, the output data is transmitted along a telephone line to another computer. Output data can also be stored for future use on a mass storage device, such as magnetic tapes or disks.

Input and output devices as well as mass storage devices are collectively called peripherals.

The second part is software – programs that control and coordinate the activities of the computer hardware and that direct data processing.

For the computer system to operate, computer programs are required. A computer program is a set of instructions for the CPU. These instructions tell the CPU where to find the input data in the system. The CPU is also instructed how to process the data and where to put the results. Programs are not hardware, as they have no electrical or mechanical components. They can be easily changed according to the user’s needs.

Computer software can be divided into two very broad categories – system software and application software.

### **Text 3 (E). Programming**

The word “program” has come into use to refer to a sequence of instructions, which a computer carries out. A program for a computer is an

exact sequence<sup>1</sup> of instructions that it uses to solve a problem. It usually consists of subroutines or subprograms, which are portions of it.

Programming for automatic computer requires a good deal of <sup>2</sup> knowledge, common sense<sup>3</sup>, and training. Specially, programming requires: (1) understanding the operations of a business or the steps of a scientific calculations; (2) understanding the best way for having a computer carry out these operations and steps; (3) arriving at a good sequence of commands for the computer to solve the problem; and (4) adequately translating these commands into the computer language.

Programming for the computer has several forms. One form is the construction of compiling programs or compilers – which use the computer to take subprograms out of a library and link (соединять) them together appropriately (соответственно) so as to solve a new problem. A second form is the construction of programs called interpreters, which accept instructions in certain standard words and translate these words into a machine language, so that the machine “knows” what the words “mean”. A third form is the development of common languages for automatic programming for problems, so that any problem when expressed in such a language can be given to any other automatic computer, and the computer will translate the common language into its own instruction code, and then solve the problem.

NOTES: <sup>1</sup> exact sequence – точная последовательность

<sup>2</sup> a good deal of – много

<sup>3</sup> common sense - здравый смысл

### Контрольная работа № 3

#### Вариант 1

**1. Перепишите следующие предложения, подчеркните в них глагол-сказуемое, определите его время, вид и залог. Переведите предложения на русский язык.**

*Например: is based – Pr. Simple Passive*

1. Despite the apparent properties of compound semiconductors, their general use has not been great because of several limitations. 2. The potential difference across the junction had been increased. 3. Magnetic amplifiers have been employed for some 50 years; transistors were reported upon in 1948. 4. Sometimes a decision to compute is followed by a process of selecting the particular kind of computing machine, which best suits for the given problem. 5. Our rockets, the first in the world, were being sent to other planets. 6. This problem must be approached from another point of

view. 7. This job cannot be done for a short period, you need at least a month. 8. It is 20 years since he left home, and he has never been heard of since. 9. Tell him he is being waited for. 10. L. Carroll is remembered not as a mathematician but as the author of *Alice in Wonderland*.

**2. Поставьте глагол-сказуемое в следующих предложениях в страдательном залоге, стараясь сохранить время.**

1. ? built these houses about 25 years ago. 2. ? must keep the sick child warm. 3. ? has translated Shakespeare's plays into many languages. 4. ? will open the new University next October.

**3. Из данных слов постройте предложения. Глаголы в скобках поставьте в нужную форму страдательного залога.**

1. will be (to teach) – Mr Green – this class – next year.
2. this film – at least a million people – has been (to see).
3. prefer – men – to be (to teach) - most boys.
4. was (to head) - the Minister of Foreign Affairs – the delegation - by.
5. Oxford – he – at – was (to educate).

**4. Трансформируйте предложения в активный залог, используя слова *they, we, somebody* в качестве подлежащего, где это необходимо.**

1. Food is eaten with chopsticks in China. 2. It was decided to refer the problem to a committee. 3. When much material had been looked through and some problems had been solved, the article was published. 4. Electric cars will be widely used in future. 5. The radar has been used for automatic control of ground transport.

**5. Перепишите и переведите на русский язык следующие предложения, обращая внимание на различные значения глаголов *to do, to be, to have*.**

1. You have to come to the language laboratory as often as possible. 2. This material does not possess elastic properties. 3. The exam was to start in the morning. 4. These computers will have to perform millions of operations. 5. The speed of electrons is almost the same as that of light. 6. The kind of electrolyte used has no effect on the electromotive force. 7. Man has made numerous inventions to increase the range of radio and TV transmissions. 8. Our task is to buy all their equipment. 9. What kinds of operations does the modern computer perform? 10. Don't do it!

**6. Трансформируйте следующие предложения в придаточные дополнительные, начав с фраз *I knew, I thought, He said*. Измените время глаголов-сказуемых в придаточных дополнительных в соответствии с правилами согласования времен. Произведите другие необходимые преобразования.**

1. My friend was born in Moscow, and since that time he has been living there. 2. The goods that have been exported from Sweden are of high quality. 3. The books you need are in great demand everywhere. 4. The letter of congratulation was sent in advance, and they certainly have got it. 5. Various registers are interconnected. 6. Each storage location in the storage section is numbered, like post-office boxes. 7. We must get the samples. I admit the complexity of this. 8. Franklin didn't know what electricity was, but he knew it could be passed through a metal wire. 9. A high level language is a language in which each instruction or statement corresponds to several machine code instructions. 10. The printers are used only as output units.

**7. Перепишите следующий диалог с целью передачи чужих высказываний в косвенной речи сначала в настоящем времени (*Например, Professor says that Alec's answer was rather good and.....*), а затем в прошедшем (*Например, Professor said that Alec's answer had been rather good and.....*). Помните, что при передаче чужого высказывания в косвенной речи действует правило согласования времен, если косвенная речь вводится глаголом в прошедшем времени!**

*Professor:* Your answer was rather good. Would you answer a few extra questions?

*Alec:* I'll try.

*Professor:* What can the computer do with the information?

*Alec:* It can calculate, compare and copy the information stored in its memory.

*Professor:* What kinds of memory do you know?

*Alec:* RAM and ROM.

*Professor:* What is RAM?

*Alec:* RAM stands for Random Access Memory, because information can be transferred into and out of any single byte of memory.

*Professor:* And what does ROM stand for?



*Alec:* ROM is Read Only Memory. It is a firmmade permanent memory chip for program storage.

*Professor:* Good. Your answers are excellent.

*Alec:* Thank you, Professor. I'm pleased, as Programming has always been my favourite subject.

**8. Передайте диалог, пересказанный в косвенной речи, в прямой речи.**

When Alec and Bob met Alec said that he had some questions about the computer interface. So he wanted Bob to explain some aspects to him. Bob answered in the positive.

The first question Alec asked concerned the notion of an interface. He added that people often used the English equivalent of that term and seemed not to differentiate between the types of interfaces. Bob explained that the interface was an interconnection between hardware, software and people. When Alec inquired what hardware interface consisted of Bob told that that type of the interface consisted of physical channels, cables, or wires that connected and exchanged electronic signals between CPU and peripherals or between any two units.

Then Alec was interested to learn what software interfaces connected in particular and Bob told that they were specific messages established between programs. Alec remembered that software interfaces were application programs, Data Base Management Systems and the operating programs. He thanked Bob and added that he felt ready to pass his exam in programming successfully.

**9. Сгруппируйте предложения в зависимости от функции герундия, а затем переведите на русский язык.**

1. Casting is a process of forming metal objects. 2. Numerous methods have been developed for producing metal castings. 3. The test needed increasing the temperature of the metal. 4. There are some ways of obtaining high quality alloys. 5. Aluminum has a melting point of 658.7° C. 6. Melting may be done in cupolas, air furnaces, electric furnaces, etc. 7. Some metals require treatment before being placed in the melting furnace. 8. We know of electric furnaces being used for the production of high-grade castings. 9. Plastics are a new group of materials replacing natural products. 10. We know of Newton's having developed principles of mechanics.

**10. Перепишите предложения. Переведите группы выделенных слов, а затем и все предложение на русский язык.**

1. *In building* new metallurgical factories, engineers have to solve many different problems. 2. *In melting* steel, electric furnaces, crucible furnaces and converters are used. 3. Liquids and gases expand *on heating*. 4. *On completing* the construction, the machine was tested in operation. 5. Casting is a process of forming metal objects *by melting* metal and *pouring* it into molds. 6. *By introducing* new methods the engineers increased the speed of manufacture. 7. High-quality programs can't be produced *without employing* qualified programmers. 8. Magnets made *by rubbing* pieces of iron against natural magnets are called artificial magnets. 9. Scientists succeeded *in developing* means of obtaining a synthetic rubber. 10. The hardening process consists *in heating* steel and *cooling* it in water.

**11. Сравните приводимые ниже предложения с инфинитивом и покажите разницу их структурных моделей через перевод.**

1. To obtain steel of the desired quality is the main subject of the experiments carried out in the research laboratory. To obtain steel of the desired quality the research laboratory carried out a lot of experiments. 2. To develop a new method of cutting metals was necessary. To develop a new method of cutting metals the engineers made some interesting experiments. 3. To design new machine tools a mechanical engineer must study much. To design new machine tools is the task of a mechanical engineer

**12. Перепишите и переведите на русский язык предложения с инфинитивом в функции определения.**

1. Engineers must know the best and most economical materials to use and understand the properties of these materials and how they can be worked. 2. Another factor for the industrial engineer to consider is whether each manufacturing process can be automated in whole or in part. 3. The problem to be discussed at the conference is of great importance. 4. Much was done to make the work engineers easier. 5. Russian scientists were the first to synthesize diamonds. 6. The road to be built next year will connect these two towns.

**13. Определите, является ли *Ving* форма причастием настоящего времени или герундием. Переведите предложения на русский язык.**

1. While decoding was taking place, other parts of the control section were prepared for the following operation. 2. We can get a better idea of the use and operation of a computer by looking at an example. 3. Programming with machine language requires knowledge of the computer and its internal connections. 4. Assembly language programming is easier to use. 5. Everything we supply to the computer for processing must be converted into binary form. 6. The cells are arranged as groups, storing a number of bits together as a byte. 7. Obtaining a byte from storage and moving it to the control block is called the fetch part of the computation cycle. 8. Input to the register is called data, and is in the form of one binary digit following the other. 9. The register is capable of processing four bits. 10. The table accompanying Fig.1 will help follow data through the register.

**14. Перепишите и переведите на русский язык следующий текст.**

Computers may have a short history but prior to their development, there were many other ways of doing calculations. These calculations were done using devices that are still used today; the slide rule being a perfect example, not to mention the ten fingers of the hands. These machines, unlike computers, are non-electronic and were replaced by faster calculating devices. It wasn't until the mid-1940s that the first digital computer was built. The post-war industrial boom saw the development of computers take shape. By the 1960s, computers were faster than their predecessors and semiconductors had replaced vacuum tubes only to be replaced in a few years by tiny integrated circuit boards. Due to microminiaturization in the 1970s, these circuits were etched onto wafer-thin rectangular pieces of silicon. This integrated circuitry is known as a chip and is used in microcomputers of all types.

It has been forecasted that exceptionally faster and smaller computers will replace those in use today.

**Вариант 2**

**1. Перепишите следующие предложения, подчеркните в них глагол-сказуемое, определите его время, вид и залог. Переведите предложения на русский язык.**

*Например: is based – Pr. Simple Passive*

1. Only in a few cases it has been possible to prepare material and devices in which the theoretical performance has been realized. 2. Various kinds of amplifiers had been used by that time. 3. Recently, much attention has been given to the study of this phenomenon. 4. The speed with which arithmetic operations are performed is affected by a number of factors. 5. The risks of going into orbit round the Earth, of returning to Earth are incalculable – an entirely new degree of human courage has been demanded. 6. The Newton's law of motion can be subjected to criticism. 7. Remember that promises must be kept. 8. The room has not been slept in for many years. 9. We were listened to with much surprise. 10. This task must have been started by our opponents.

**2. Поставьте глагол-сказуемое в следующих предложениях в страдательном залоге, стараясь сохранить время.**

1. ? has not found the lost child yet. 2. ? The letters will be ready in a few minutes. ? is typing them now. 3. You can't go into the sitting room. ? is painting the walls. 4. When the doctor called to see the baby, ? was feeding him.

**3. Из данных слов постройте предложения. Глаголы в скобках поставьте в нужную форму страдательного залога.**

1. was (to blow off) – my hat – the wind.  
2. her birthday – any of her friends – wasn't (to forget).  
3. children – their grandparents – are often (to spoil).  
4. she – in the library – every day – can be (to see).  
5. next year – is (to invite) – to England – she – to come.

**4. Трансформируйте предложения в активный залог, используя слова *they, we, somebody* в качестве подлежащего, где это необходимо.**

1. It is known that he can show us how to calculate using the computer.  
2. The experiments on the new microcomputer must be finished in a month. 3. The last word will be said by the judge. 4. Today plastics are being applied for car bodies (корпуса автомобилей). 5. The construction of the dam has been completed this month.

**5. Перепишите и переведите на русский язык следующие предложения, обращая внимание на различные значения глаголов *to do, to be, to have*.**

1. Men had to learn to obtain electric power directly from the Sun. 2. The engineers are to study the problem of using cosmic rays. 3. Soon our industry will have new and cheap sources of energy. 4. The term *Integrated Circuit* is used to describe a group of electronic elements connected together. 5. It is necessary to use film circuits where the ratio of passive to active devices is high. 6. Some of the properties, which we now associate with semiconductors, have been known for a century or more. 7. Tubes have to be replaced by transistors in amplifiers. 8. They will do their work in time. 9. Don't allow the children to play in the street. 10. Did you buy flowers?

**6. Трансформируйте следующие предложения в придаточные дополнительные, начав с фраз *I knew, I thought, He said*. Измените время глаголов-сказуемых в придаточных дополнительных в соответствии с правилами согласования времен. Произведите другие необходимые преобразования.**

1. If the weather is fine on Sunday, we shall go to the country. 2. His knowledge in English is quite satisfactory though he makes some grammar mistakes. 3. Faraday produced electricity through magnetism, which had never been done before. 4. Last month my colleague went abroad where he intended to stay for two weeks. 5. We must speed up the work. I understand the necessity of this. 6. Each line can be programmed for input or output. 7. Some substances are alike in their properties but differ in their mass. 8. I have to do a lot of work about the house: washing up, doing the flat, cooking are my duties. 9. The first international chess match was played over 100 years ago. 10. Much attention will be given to artificial intelligence techniques applicable to problem solving and to man-machine interface.

**7. Перепишите следующий диалог с целью передачи чужих высказываний в косвенной речи сначала в настоящем времени (*Например, Professor says that Alec's answer was rather good and.....*), а затем в прошедшем (*Например, Professor said that Alec's answer had been rather good and.....*). Помните, что при передаче чужого высказывания в косвенной речи действует правило согласования времен, если косвенная речь вводится глаголом в прошедшем времени!**

*Professor:* Your answer was rather good. Would you answer a few extra questions?

*Alec:* I'll try.

*Professor:* You know, a chip is a miniaturized electronic circuit. What elements does it contain?

*Alec:* A chip contains several hundred thousand electronic components – transistors, resistors and others.

*Professor:* Are there any other terms, which are synonymous to chip?

*Alec:* Yes, there are. They are integrated circuits and microelectronics.

*Professor:* What types of chips can you describe?

*Alec:* Logic chips and Memory chips. Logic chips perform some or all the functions of a processor. Memory chips are storage cells.

*Professor:* May larger computers use several types of microprocessors?

*Alec:* Yes, of course. Even desk computers use one or more microprocessors.

*Professor:* Your answer is good so you get a five.

*Alec:* Thank you, Professor, good-bye.

#### **8. Передайте диалог, пересказанный в косвенной речи, в прямой речи.**

When Alec met his friend David he said that he was interested to know what a programming language was. He knew each computer had a repertoire of operations to perform. So he wanted David to explain him if the notions a “machine language” and a “programming language” were the same.

David agreed and began. He said that to perform a task a user must choose the appropriate instructions from the repertoire and sequence them properly. So the means of specifying the instructions and their sequencing was called the “programming language”.

Then Alec guessed that machine language was in reality a programming language and David said that his friend was quite right. He only emphasized that it was the lowest level programming language, the language of binary 1's and 0's. Alec remembered that computer hardware understood only a binary program but he wanted if there were any drawbacks to machine level coding.

David answered that the drawbacks were numerous. The most inconvenient thing about the machine level coding was that it took a long time to learn, write and debug. He added that errors would very likely occur and the most unpleasant thing was that corrections were difficult to make.

When Alec asked why Davis replied that the language itself was abstract and perhaps Assembly Language was easier in use. Alec thanked his friend

and said he would have to go to the library and read some manual on programming languages.

**9. Сгруппируйте предложения в зависимости от функции герундия, а затем переведите на русский язык.**

1. Casting is a process of forming metal objects. 2. Numerous methods have been developed for producing metal castings. 3. The test needed increasing the temperature of the metal. 4. There are some ways of obtaining high quality alloys. 5. Aluminum has a melting point of 658.7° C. 6. Melting may be done in cupolas, air furnaces, electric furnaces, etc. 7. Some metals require treatment before being placed in the melting furnace. 8. We know of electric furnaces being used for the production of high-grade castings. 9. Plastics are a new group of materials replacing natural products. 10. We know of metallurgical industry having made a great progress.

**10. Перепишите предложения. Переведите группы выделенных слов, а затем и все предложение на русский язык.**

1. *In building* new metallurgical factories, engineers have to solve many different problems. 2. *In melting* steel, electric furnaces, crucible furnaces and converters are used. 3. Liquids and gases expand *on heating*. 4. *On completing* the construction, the machine was tested in operation. 5. Casting is a process of forming metal objects *by melting* metal and *pouring* it into molds. 6. *By introducing* new methods the engineers increased the speed of manufacture. 7. High-quality programs can't be produced *without employing* qualified programmers. 8. Magnets made *by rubbing* pieces of iron against natural magnets are called artificial magnets. 9. Scientists succeeded *in developing* means of obtaining a synthetic rubber. 10. The hardening process consists *in heating* steel and *cooling* it in water.

**11. Сравните приводимые ниже предложения с инфинитивом и покажите разницу их структурных моделей через перевод.**

1. To be an ideal engineer means to have knowledge, to improve one's ability to analyze, synthesize and develop insight into one's field. To be an ideal engineer one is to have knowledge, to improve one's ability to analyze, synthesize and develop insight into one's field. 2. To master a foreign language is necessary for all students. To master English you must work hard. 3. To measure temperature is quite simple. To measure temperature it is necessary to choose some kind of temperature scale.

**12. Перепишите и переведите на русский язык предложения с инфинитивом в функции определения.**

1. A. Popov was the first to invent the radio. 2. They were looking for a knife to cut bread with 3. The article to be read is of great interest to us. 4. The text to be translated described first experiments with electricity. 4. What method is to be chosen in this case? 5. The method to be chosen in any particular case depends on many factors. 6. New types of telemetry equipment to operate with electronic computer is the subject of our next scientific conference.

**13. Определите, является ли *Ving* форма причастием настоящего времени или герундием. Переведите предложения на русский язык.**

1. Heating the gas increases the speed of the molecules. 2. Having made the experiment, the research engineer recorded the data. 3. Translating from one language to another we can use electronic dictionaries. 4. Translating from one language to another has been accomplished by a qualified engineer. 5. The failure was due to the operator's having been careless in using the instrument. 6. Most applications requiring storage and manipulation of small amounts of digital information use registers. 7. The numbers must be carefully stored for arithmetic processing. 8. The home remote control system operates by transmitting coded information on the power lines running throughout the house. 9. The task is performed by starting with the first step in the program, then proceeding immediately to the next step. 10. Very soon the microprocessor will be integrating various energy sources for most efficient environmental control.

**14. Перепишите и переведите на русский язык следующий текст.**

There has long been an interest in language translation and, in particular, in the prospects of automatic translation by computer.

In the 1960s when the translation studies began, there was already considerable stirring among professional linguists and others about the efficiency of translation by computer or machine translation (MT). At that time different modes of translation were compared. That is, human translations against different versions of MT. Soon the researchers conducting the studies were able to add to their observations from the output of the latest MT system that had become operational. Within a year, they submitted a Russian paper for translation by the then operational MT



system. Two characteristics of MT output are: 1) untranslated words and 2) translated words that have two or more meanings in the target language<sup>1</sup>. An examination of the post-translation editing showed that many corrections had been made: each of the approximately 80 sentences had had some corrections and modifications, most of them being extensive. About 35% of the English words had been altered by the editor.

It would be unwise to conclude on a less-than-optimistic note. However, it is apparent that little progress has been made during recent years. There are no demonstrated advantages of MT over human translations. Other methods should be applied to determine the readability of translation. Researchers are now collecting such data.

<sup>1</sup>the target language – *зд.* язык, на который делался перевод

### Вариант 3

**1. Перепишите следующие предложения, подчеркните в них глагол-сказуемое, определите его время, вид и залог. Переведите предложения на русский язык.**

*Например: is based – Pr. Simple Passive*

1. Compound semiconductors have been applied to a great extent. 2. The performance characteristics of amplifiers will have been altered. 3. The model has been modified and is now being used in many practical situations. 5. Magnetic amplifiers have been employed for some 50 years; transistors were reported upon in 1948. 5. The problem will be dealt with in the next chapter. 6. Which of the two operations is to be performed next?

7. Those who learn a foreign language must follow spelling and grammar rules. 8. They left before the hour of the next meeting has been agreed upon. 9. She was being laughed at by everybody. 10. They say that paper must have been invented in China.

**2. Поставьте глагол-сказуемое в следующих предложениях в страдательном залоге, стараясь сохранить время.**

1. ? killed thirty people and ? injured (травмировать, получать увечье) 65 in that terrible accident. 2. ? hid the treasure in a place which no one could find. 3. ? can't learn a foreign language in a few days. 4. The dog was mad and ? had to shoot it.

**3. Из данных слов постройте предложения. Глаголы в скобках поставьте в нужную форму страдательного залога.**

1. a few students – was (to do) – this exercise – correctly.
2. this book – a very young author – was (to write).
3. is being (to make) – his new suit – a first-class tailor.
4. the sun rays – is (to give) - to us – heat.
5. alone – often – was (to leave) – the child – home.

**4. Трансформируйте предложения в активный залог, используя слова *they, we, somebody* в качестве подлежащего, где это необходимо.**

1. Harry wasn't punished at all.
2. The problem will be dealt with in the next chapter.
3. They knew that the reason had been explained to us.
5. Today plastics are being widely used instead of metals.

**5. Перепишите и переведите на русский язык следующие предложения, обращая внимание на различные значения глаголов *to do, to be, to have*.**

1. Don't come at 9 o'clock.
2. Did he do his work well?
3. The operators dealing with radioisotopes must have protective suits.
4. The engineers are to study the problem of using artificial intelligence.
5. We had to change the design of this machine.
6. There are two main classes of film and hybrid integrated circuits.
7. The transistors and diodes are widely used on monolithic integrated circuits because of the relatively small size.
8. The semiconductor may have a net positive electrostatic charge.
9. The pilots had to maintain direct radio contact between the planes.
10. A modern automatic digital computer does more than 100 mln operations in each second.

**6. Трансформируйте следующие предложения в придаточные дополнительные, начав с фраз *I knew, I thought, He said* . Измените время глаголов-сказуемых в придаточных дополнительных в соответствии с правилами согласования времен. Произведите другие необходимые преобразования.**

1. My foreign friends are going to send me an invitation for visiting Paris.
2. We can simplify this question. But there is no need for doing this.
3. A calculator is just any other electronic system, except that it uses digital electronics instead of analog electronics.
4. Everybody is going to attend the scientific conference, which is to be held in our city in May.
5. The TV program does not seem interesting and viewers cannot expect any positive changes in it.
6. He does not have to take a bus – he lives near the

University. 7. The experiment has already been conducted, and scientists are pleased with the results. 8. It took him a lot of effort to complete the experiment in time. 9. Some of the most respected publications declared that a machine could never do anything that required thought. 10. How are directions to be expressed to the computer?

**7. Перепишите следующий диалог с целью передачи чужих высказываний в косвенной речи сначала в настоящем времени (Например, *Professor says that Alec's answer was rather good and.....*), а затем в прошедшем (Например, *Professor said that Alec's answer had been rather good and.....*). Помните, что при передаче чужого высказывания в косвенной речи действует правило согласования времен, если косвенная речь вводится глаголом в прошедшем времени!**

*Professor:* Your answer was rather good. Now I would like to ask you a few extra questions.

*Alec:* Yes, Professor. I'm ready.

*Professor:* What is an interface?

*Alec:* An interface is interconnection between hardware, software, and people.

*Professor:* That is right. Do you agree that there are hardware interfaces and software interfaces?

*Alec:* Yes, I do. There are also interfaces between people and computers. They are terminal screens and keyboards.

*Professor:* And what are hardware interfaces?

*Alec:* They are physical channels, cables, or wires. They connect and exchange electronic signals between the CPU and peripherals or between any two units.

*Professor:* And what about software interfaces? Can you give any example?

*Alec:* Software interfaces are application programs, Data Base Management Systems, communication programs, and the operating system.

*Professor:* And what are they?

*Alec:* They are specific messages established between programs.

*Professor:* Good. I like your answer. Your mark is a five.

*Alec:* Thank you, Professor. Good-bye.

**8. Передайте диалог, пересказанный в косвенной речи, в прямой речи.**

One day David met his friend John and asked him whether John knew something about translating machines. John replied that translating machines had been built many times but none of them, however, had done its job well enough. That was the reason why research on translating machines had gone continuously.

Then David said that one day he had seen a CD with some programs, which might help to translate from Russian into English.

John advised David not to waste money and time because all these programs were unable to produce intelligible translation. They merely substituted Russian words with English equivalents and did not analyze the relations between the words of each sentence.

David exclaimed that when translating so many logical processes were involved. He added that the machine must know much about grammar, and Russian grammar was so different from English.

John also said that the commonest problem was where a word could have more than one meaning. A human translator would know which meaning to choose from the context. But machines had been known to make the wrong choice because if a machine was to make usable translations, it itself must be able to extract some, at least, of the meaning of the text. So John concluded that such machines were much further off and recommended David to study English hard.

**9. Сгруппируйте предложения в зависимости от функции герундия, а затем переведите на русский язык.**

1. Casting is a process of forming metal objects. 2. Numerous methods have been developed for producing metal castings. 3. The test needed increasing the temperature of the metal. 4. There are some ways of obtaining high quality alloys. 5. Aluminum has a melting point of 658.7° C. 6. Melting may be done in cupolas, air furnaces, electric furnaces, etc. 7. Some metals require treatment before being placed in the melting furnace. 8. We know of electric finances being used for the production of high-grade castings. 9. Plastics are a new group of materials replacing natural products. 10. Mankind is interested in atomic energy being used only for peaceful purposes.

**10. Перепишите предложения. Переведите группы выделенных слов, а затем и все предложение на русский язык.**

1. *In building* new metallurgical factories, engineers have to solve many different problems. 2. *In melting* steel, electric furnaces, crucible furnaces and converters are used. 3. Liquids and gases expand *on heating*. 4. *On completing* the construction, the machine was tested in operation. 5. Casting is a process of forming metal objects *by melting* metal and *pouring* it into molds. 6. *By introducing* new methods the engineers increased the speed of manufacture. 7. High-quality programs can't be produced *without employing* qualified programmers. 8. Magnets made *by rubbing* pieces of iron against natural magnets are called artificial magnets. 9. Scientists succeeded *in developing* means of obtaining a synthetic rubber. 10. The hardening process consists *in heating* steel and *cooling* it in water.

**11. Сравните приводимые ниже предложения с инфинитивом и покажите разницу их структурных моделей через перевод.**

1. To explain this simple fact is not very easy. To explain this fact you must know certain rules. 2. To find the mass of the electron was then of prime importance. To use electric currents properly we must be able to detect and measure them. 3. To insulate is to surround a conductor with insulating material. To explain why the temperatures of the observed bodies are quite different one should refer to the laws of hydrodynamics.

**12. Перепишите и переведите на русский язык предложения с инфинитивом в функции определения.**

1. The instruments to be used in this experiment have been provided with filters. 2. Lomonosov was the first to discover that heat, light and electricity are different forms of movement. 3. The problem mentioned above and to be considered in this paper is concerned with new principles of computer design. 4. The problem to be studied can be simplified by the use of controlled experimental conditions. 5. Industrial robots to be built now perform certain tasks even better than the man. 6. Another factor for the industrial engineer to consider is whether each manufacturing process can be automated in whole or in part.

**13. Определите, является ли *Ving* форма причастием настоящего времени или герундием. Переведите предложения на русский язык.**

1. This can be illustrated by examining the memory chip. 2. Then a final process known as metalisation completes the chip, thus reducing the processing time for a new design by two-thirds. 3. For systems requiring lower performance there is a choice: choice of technology and choice of design. 4. The designers have aimed at gaining performance by reducing the complexity of the control logic. 5. Solving these complex equations may require a digital computer. 6. The advantages of the new equipment is functioning under wide changes of temperature and pressure. 7. This represents a set of programs concerned with displaying, analyzing, checking and simulating the design. 8. Nearly all components and interconnections for data-processing equipment are fabricated by automated printing techniques, with the information for the manufacturing data being in digital form. 9. When applying these two methods, consideration should be given to the physical phenomenon. 10. The automated landing system must ensure landing the passenger airplane at night.

**14. Перепишите и переведите на русский язык следующий текст.**

There are several advantages in making computers as small as possible. Sometimes weight is particularly important. A modern aircraft, for example, carries quite a load of electronic apparatus. If it is possible to make any of these smaller, and therefore lighter, the aircraft can carry a bigger load. This kind of consideration applies to space satellites and to all kinds of computers that have to be carried about.

But weight is not the only factor. The smaller the computer the faster it can work. The signals go to and from at a very high but almost constant speed. So if one can scale down all dimensions to, let us say, one tenth, the average lengths of the current paths will be reduced to one tenths. So, very roughly speaking, scaling down of all linear dimensions in the ratio of one to ten also gives a valuable advantage, the speed of operation is scaled up to 10 times. Other techniques allow even further speed increase.

The increase of operation is a real advantage. Another advantage is that less power is required to run the computer. In space satellites this is an important matter. Another advantage is reliability. Mini-computers have been made possible by the development of integrated circuits. Repair of any kind is no longer needed. If one component circuit develops a fault, all that is needed is to locate the faulty unit, throw it away and plug in a new one.

## КОНТРОЛЬНОЕ ЗАДАНИЕ № 4 TECHNOLGY AGE

Для правильного выполнения задания № 4 необходимо усвоить следующие разделы курса грамматики английского языка по любым учебным пособиям:

1. Основные сведения о сослагательном наклонении. Аналитические и синтетические формы сослагательного наклонения. Сослагательное наклонение в условных придаточных предложениях.
2. Сложные формы инфинитива, герундия и причастия. Обороты, равнозначные придаточным предложениям:  
Объектный инфинитивный оборот (*Complex Object*);  
Субъектный инфинитивный оборот (*Complex Subject*);  
Самостоятельный (независимый) причастный оборот (*Absolute Participial Construction*);  
Конструкции с герундием (*Gerundial Complexes*).
3. Сложные предложения. Способы перевода придаточных определительных, обстоятельственных и дополнительных предложений.

После изучения указанного выше материала можно приступить к выполнению задания.

### 1. ТЕКСТЫ ДЛЯ ИЗУЧАЮЩЕГО ЧТЕНИЯ, ПЕРЕВОДА И ПОВТОРЕНИЯ ГРАММАТИЧЕСКОГО МАТЕРИАЛА

#### Text 4 (A). 20<sup>th</sup> Century. Summing up...

Technology has made modern society possible. It has added to leisure time and reduced the long hours of work. Technology can allow the world feed itself. It has reduced the effects of natural catastrophes. The world is now a smaller place where people can communicate with each other and travel rapidly everywhere.

The establishment of the assembly line by Henry Ford in 1913 made automobiles inexpensive enough. Technology has raised the standard of living. The 20<sup>th</sup> century has become the century of many inventions. New materials (e.g. synthetic rubber, artificial fabrics and plastics) have affected the ways of life and fashion.

Electronics was ushered in when Marconi sent the first transatlantic radio message in 1901. Radio and television changed communications and

entertainment habits. In 1948 the transistor was invented, and the era of modern computers was started.

In 1957 the Space Age began, when the first Earth-orbiting satellite – Sputnik – was launched by the Soviet Union.

Medical technology was expanded by the use of new medicines and new equipment. New technologies in biology led to genetic engineering, in which living cells can be altered. In 1996 a lamb called Dolly has become the first large animal? which was cloned from the genetic material extracted from the adult cell.

Technology keeps advancing at a rapid rate. It can only be guessed what the “information revolution” of the late 20<sup>th</sup> century will bring about.

#### **Text 4 (B). Cosmonautics**

The development of cosmonautics is closely connected with the achievements of pilots and spacemen, aircraft and spacecraft engineers and builders.

Aviation has become the cradle of cosmonautics. And this was not accidental/ At the turn of the 20<sup>th</sup> century the Russian scientists Konstantin Tsiolkovsky solved several problems on the theory of reactive movement and substantiated the possibility of manned space flight. His theoretical calculations have been extensively used by scientists in all countries.

In the 1920s several groups of scientists and engineers worked on the problems of rocketry in the Soviet Union. In 1934 a research Institute of reactive Propulsion was organized and all the fundamental works and investigations in rocketry were concentrated in it. It was this institute that trained many outstanding experts in rocketry, including S. Korolyov who subsequently became chief designer of powerful multi-stage rockets.

Today, outer space is not merely an object of study; it is also an enormous laboratory where new materials and design structures are tested under natural conditions. Cosmonautics is becoming more international in nature, mainly for global scientific, engineering and economic reasons.

A vital step towards understanding the Solar System and the Universe is the flight to another celestial body though such an exploration will take generations. Landing on the Moon is just the beginning – not the end – of a new era of discovery of new worlds. Manned flight to Mars seems to be the next logical step.

From the scientific and engineering standpoint, a typical Mars landing mission might begin with the orbiting of the elements for either one or two



identical spaceships by newly developed “space shuttles”. These are reusable carriers for transporting men and equipment between the ground and the Earth’s orbit. While the mission could be carried out with a single ship, the use of two would provide an additional safety factor, since each would be large enough to accommodate the astronauts of its sister ship in the event of a major failure. Furthermore, with two ships, additional equipment could be carried. The nominal crew of each ship would be six men.

The spaceship itself would be divided into major three sections: the forward compartment housing the Mars surface exploration module; the main mission module with living quarters, the control area, experimental laboratories, and a radiation shelter in which the crew could live during periods of intense solar activity; and the biological laboratory for receiving and analyzing surface samples from Mars.

The entire spaceship would be continuously rotated. If two ships made the trip simultaneously, they could be docked end-to-end and rotated in the plane of the longitudinal axis.

No doubt, the time will come when people will build and inhabit orbiting stations and reach other planets in order to harness outer space to serve the mankind.

#### **Text 4 (C). Robotics: Japan Takes the Lead**

In the mid-1960s Prof. Hiroyasu Funakubo of Japan’s Medical Precision Engineering Institute<sup>1</sup> was handed a particularly challenging assignment: develop an artificial limb for thalidomide<sup>2</sup> babies born without arms. Eight years later Funakubo produced an aluminum and carbon-fiber arm powered by eleven separate micromotors – which, on command, could duplicate almost any function of the human arm. Professor Funakubo’s arm proved too expensive for its intended purpose. But it has turned out to be a key element in a generation of “mechatronic” robots.

This class of robots seemed to cement Japan’s position as world leader in the business for years to come. Japanese companies moved into the field and quickly conquered the market. By the end of 1980s Japanese producers had supplied about 70% of the industrial robots working in the Western world. Nevertheless, industry leaders in Japan feel their biggest growth is yet to come.

Much of the growth is likely to stem from research like Professor Funakubo’s. The electrical arm is much more accurate than the hydraulic arms used in many robot models, and robot manufactures are now

confident they will produce “intelligent robots” that will be able to “see” and “feel” and take over more production-line and commercial functions. For example, there has been developed a snake-like robot that can creep through pipes and other narrow openings to inspect and even do repair work in places inaccessible to humans. One Japanese company is getting ready to market a janitor-watchman<sup>3</sup> that is simultaneously able to clean the floor and send out radio signals warning against fires or intruders. In the prototype stage are even more sophisticated devices: a 25-fingered breast-cancer detector, a Seeing Eye dog and a home-care system for invalids.

Most of the new robots are expected to be used in heavy industry, where the current generation of smart machines has already proved popular in automotive and other assembly plants, performing such tasks as spot welding and body painting.

Industry around the world is looking for robots to save on labour costs. Nissan Motor says that its new light-truck plant in Smyrna, U.S., is equipped with more than 200 robots. Experts also point out that demographic trends show fewer people coming into the job market in the years ahead, making robots something of a necessity. Robots may also take over jobs that humans find undesirable – such as coal mining.

While industry should continue to be the biggest markets for robotry, some of the more interesting developments are taking place in the medical field. Funakubo’s arms, for example, have been mounted in pair on a bedside table and linked to a robot cart that shuttles back and forth between a storage cabinet and the patient’s bed. That system can be activated by keyboard, voice command and even by whistles and gasps. The cart and the arms can find and deliver to the patient a newspaper or a piece of fruit – anything that is stored in the cabinet. As yet the fingers of the arms are not able to peel the fruit, but Funakubo thinks they will have that capacity.

Among the other new robots under development is the Melkong, which can pick the patient gently off his bed, put him in a bathtub and deposit him back in bed again.

Not all of the applications on the robotry drawing boards will prove to be practical. But the demand for new smart machines will continue. After all, they never go on vacation, take a break or ask for a rise.

NOTES: <sup>1</sup> институт точной медицинской техники

<sup>2</sup> седативный препарат, в результате приема которого женщина может родить ребенка с деформированными конечностями

<sup>3</sup> уборщик и сторож одновременно

#### **Text 4 (D). The Engineering Profession**

Engineering is one of the most ancient occupations in history. Without the skills included in the broad field of engineering, our present-day civilization never could have evoked. The first toolmakers that chipped arrows and spears from rock were forerunners of modern mechanical engineering. The craftsmen who discovered metals in the earth and found ways to refine and use them were ancestors of mining and metallurgical engineers. And the skilled technicians who devised irrigation systems and erected the marvelous buildings of the ancient world were the civil engineers of their time.

Engineering is often defined as making practical application of theoretical sciences such as physics and mathematics. Many of the early branches of engineering were based not on science but on empirical information that depended on observation and experience.

The great engineering works of ancient times were constructed and operated largely by means of slave labour. During the Middle Ages people began to seek devices and methods of work that were more efficient and humane. Wind, water and animals were used to provide energy for some of these devices. This led to the Industrial Revolution, which began in the 18<sup>th</sup> century. First steam engines and then all kinds of machines took over more and more of the work that had previously been done by human beings or by animals.

By the end of the 19<sup>th</sup> century not only were mechanical, civil, and mining and metallurgical engineering established but newer specialties of chemical and electrical engineering also emerged. This growth in the number of specialists is continuing with the establishment of such disciplines as aerospace, nuclear, petroleum, and electronic engineering.

Engineering has become a profession. Today technological and industrial progress depends on it and the engineer must combine many of the characteristics of the scientists, research engineer and technologist. His interest must be in combining the abstract-theoretical world and the technical-practical world.

## Контрольная работа № 4

### Вариант 1

**1. Перепишите и письменно переведите данные ниже предложения, учитывая особенности употребления сослагательного наклонения в английском языке:**

1. I should help him with pleasure. 2. He would tell me the news. 3. I should read this novel too, but I can't get it. 4. We should go to the country with you. 5. She would go abroad for a month, but she won't be able to finish her experiments. 6. I should have gone to the country with you but I fell ill. 7. It is impossible that they should have done this. 8. It was desirable that he should come. 9. Tom insisted that we should come together. 10. He suggests that we should go to a restaurant. 11. Don't sit in the draught lest you should catch cold. 12. I wish I were you. 13. I feel as if I were back seven years. 14. He wished he had not said these words.

**2. Перепишите и письменно переведите данные предложения, содержащие придаточные условные. Определите тип условного предложения (реальное или нереальное условие):**

1. If you intensify the process by heating the materials, you'll save a great deal of time. 2. If we fail to find the materials mentioned in the description, we shall try to use those available in the laboratory. 3. If we had any trouble with the equipment we were using in the tests, the engineer would always help us. 4. If the new materials such as plastics were applied in railway transport to a considerable extent, van and car bodies would have a long life and low costs of maintenance. 5. If the technician had given instructions we should have carried out the experiments successfully. 6. Had the students studied the English language well enough when they were at school, they would have been able to read any book without a dictionary. 7. If the same temperature is maintained all the time, we shall obtain the desired results. 8. If you applied this method, you would get better results. 9. If you had classified the data, fewer tests would have been needed. 10. Should you ask me what the advantages of plastics are I shall begin with those of their properties?

**3. Употребите нужную форму сослагательного наклонения в придаточном предложении:**

1. I shouldn't have believed it if I .....it with my own eyes.

- a) didn't see                      b) haven't seen                      c) hadn't seen

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2. He might have understood it if you .....slowly.  
a) have spoken                      b) had spoken                      c) would speak
3. He would take me with him if I .....ready.  
a) were                                      b) had been                      c) should be
4. The newspaper would print the story if it .....true.  
a) were                                      b) had been                      c) was

**4. Употребите нужную форму сослагательного наклонения в главном предложении:**

1. If I had known that you were in hospital I .....you.  
a) shall visit                      b) should visit                      c) should have visited
2. If I knew that the traffic lights were red I .....  
a) would have stopped                      b) would stop                      c) should stop
3. If you had obeyed my instructions you ..... into trouble.  
a) wouldn't get                      b) wouldn't have got                      c) couldn't get
4. If I hadn't been wearing tight shoes I .....the bus quite easily.  
a) should catch                      b) should have caught                      c) caught

**5. Поставьте глагол в скобках в нужную форму сослагательного наклонения:**

1. If you (to bring) me a book, I (to read) it. 2. If he (not to ring) me up, I (not to come). 3. If he (not to write) to me, I (not to answer) him. 4. If I (to be) you, I (to apologize) to her. 5. If he (to be in), he (to answer) the phone. 6. I (not to take) your umbrella if I (to know) that it was the only one you had. 7. He (to be) the best pupil in the class if he (to work) harder. 8. We (to stay) at home if we (to know) he was coming. 9. If I (to know) they were in town, I (to invite) them to dinner. 10. It (to be) fun to go to the park, if it (to be) a nicer day.

**6. Перепишите и переведите следующие предложения, принимая во внимание многозначность английских глаголов *should* и *would*:**

1. The workers insisted that the new method should be introduced without delay. 2. I thought that I should meet you in the laboratory. 3. We should meet today or tomorrow to discuss some of the common problems. 4. Should we have any trouble with the machine, we may ask the engineer to

give instructions to us. 5. I believed that we should double the output after having introduced new machine tools. 6. I thought it would be difficult to avoid the motor overheating. 7. It would be difficult to avoid the overheating of the motor without introducing an effective cooling system. 8. If we began the work immediately, it would be finished by the end of the day. 9. I remember when I was at school I had a motorbike and I would spend hours overhauling it. 10. If the motor wouldn't start in spite of all that, I would ask my father to help me and he would locate the trouble in no time.

**7. Перепишите и письменно переведите данные ниже предложения, учитывая особенности перевода зависимого и независимого причастного оборота:**

1. When calculating the weight of a body, we have to multiply its specific gravity by its volume. 2. While working at his new computer, the inventor made numerous improvements. 3. When translating some new text he used to write out all new words. 4. An electron computer forms an impressively complex device, when viewed as a whole. 5. When using a controller on a modern military aircraft, it can perform automatic testing of aircraft equipment. 6. Other conditions being equal, iron heats up faster than aluminum. 7. Personal computers being used for many purposes, scientists go on improving their characteristics. 8. There were some reports concerning electric waves at the Congress of 1896, Popov's report of the new type of communication being the center of attention. 9. The machines arriving to day, we shall proceed to mount them. 10. The new instrument being designed in our laboratory will be used in radio engineering research. 11. The box is then turned, with its lid being gradually raised. 12. My father, being an engineer himself, was very pleased when he heard me speaking to my schoolmates about the methods of making various kinds of steel.

**8. Перепишите и письменно переведите следующие предложения, принимая во внимание, что инфинитив в конструкциях *Complex Object* и *Complex Subject* часто соответствует придаточным предложениям в русском языке:**

A. 1. We expect this discovery to produce great changes in the field of electronics. 2. We want this machinery to be utilized to 80 % of its capacity. 3. He assumed the vacuum tubes to have been made of all sizes. 4. The engineer wants this new computer to be tested under very severe

conditions. 5. Many people believe computers to be able to solve problems yet unsolved. 6. We observe the precision required during processing be constant. 7. The test has shown the system to be oriented principally to general business and industrial data processing. 8. The scientist believes a microcomputer system designed for severe-environment industrial application to have been constructed.

B. 1. The use of mercury in thermometers appears to have been first mentioned in the middle of the 18<sup>th</sup> century. 2. The rocket is known to be an engine, which propels itself by using liquids as fuel. 3. Every educated person is supposed to know Newton's Third Law "For every action there is an equal and opposite reaction". 4. The human beings seem not to be able to add or multiply without using auxiliary devices such as pencil and paper. 5. The first stage appears to have taken almost a month to complete. 6. A party to investigate the local materials available for construction is expected to submit its report by the first of March. 7. These devices are considered to be very effective. 8. These changes are expected to take place due to the Earth magnetism.

**9. Перепишите и письменно переведите предложения, содержащие конструкции с герундием:**

1. They heard of the 8.30 train having left some minutes before. 2. I remember this weapon having been mentioned in the history of the First World War. 3. He mentioned his having tested this particular material for strength with entirely satisfactory results. 5. We know of his having been instructed to find a satisfactory substitute for copper. 6. The engineer insisted on plywood being used instead of metal for some parts of the car. 7. I can't help his confiding his troubles on me. 8. She was displeased with her daughter's having accepted the invitation.

**10. Перепишите следующие сложноподчиненные предложения, подчеркните в них придаточные и укажите, являются ли они дополнительными (Д) или определительными (О):**

1. In this case we can suppose that a molecule consists of two equal atoms. 2. Perhaps, the most important uses of radar are those that give greater reliability to sea and air travel. 3. It is necessary to know whether or not the molecules can still rotate freely in the crystal at the lowest temperature. 4. The asymmetry we observe indicates that the electrons strike the plate with a tendency to spin to the right rather than to the left. 5. The latest investigations show how this deflection system works. 6. It is

interesting to know if this circuit is a low-level noise device. 7. The computer, which can utilize both analog and digital data is called hybrid computer.

**11. Перепишите и письменно переведите на русский язык приводимый ниже текст**

Computers may have a short history but prior to their development, there were many other ways of doing calculations. These calculations were done using devices, which are still used today; the slide rule being a perfect example, not to mention the ten fingers of the hands. These machines, unlike computers, are non-electronic and were replaced by faster calculating devices. It wasn't until the mid-1940s that the first digital computer was built. The post-war industrial boom saw the development of computers take shape. By the 1960s, computers were faster than their predecessors and semiconductors had replaced vacuum tubes only to be replaced in a few years by tiny integrated circuit boards. Due to microminiaturization in the 1970s, these circuits were etched onto wafer-thin rectangular pieces of silicon. This integrated circuitry is known as a chip and is used in microcomputers of all kinds.

It has been forecasted that exceptionally faster and smaller computers will replace those in use today.

**Вариант 2**

**1. Перепишите и письменно переведите данные ниже предложения, учитывая особенности употребления сослагательного наклонения в английском языке:**

1. I should gladly do this work instead of you. 2. Our students would take part in the forthcoming conference. 3. I think he would visit this exhibition. 4. He would inform you of it, but he'll be busy the whole week. 5. We know this film would be a success abroad. 6. I should have come to see him. 7. The doctor demanded that the patient should stay in bed for some more days. 8. It was necessary that we should do it at once. 9. She suggests that we should come to see him tonight. 10. Put down my address lest you should forget it. 11. They insisted that he should make a report about the results of his investigation. 12. He speaks English as if he had lived in England all his life. 13. She wishes she were understood by everybody. 14. She feels as though she were guilty in everything happened.



**2. Перепишите и письменно переведите данные предложения, содержащие придаточные условные. Определите тип условного предложения (реальное или нереальное условие):**

1. Pilots and technicians can perform their duties better if they know the characteristics and limitations of an airplane. 2. If such a computer system were introduced, most requirements would be satisfied. 3. If the computer systems endowed with artificial intelligence were developed, they would be able to think like humans and improve their performance on the basis of experience. 4. Had the wall thickness been 0.025 instead of 0.25 in., the first natural frequency would have been 14 Hz instead of 140 Hz. 5. If the metal surface of the cathode is chemically and physically clean, the discharged atoms of copper will be deposited within normal interatomic spacing of the atom of the basic metal. 6. Had they introduced new devices, they wouldn't have had any trouble with the equipment. 7. Aeronautical engineering would have taken a very different course, had aluminum alloys with suitable properties not been developed. 8. The pilot could perform his duties better if he knew all the characteristics and limitations of an airplane. 9. All computers must have access to the outside world if they are to do useful work. 10. If an applied voltage of one volt produced a current of one ampere, the resistance would be one ohm.

**3. Употребите нужную форму сослагательного наклонения в придаточном предложении:**

1. He would have participated in the conference if he .....ill.  
a) didn't fall      b) wouldn't fall      c) hadn't fallen
2. If I ..... school this year, I should enter the physics department of the University.  
a) shall finish      b) finished      c) have finished
3. He would translate this paper without any difficulty if you .....him a dictionary.  
a) will give      b) have given      c) gave
4. If I .....busy, I should have visited the exhibition.  
a) were not      b) haven't been      c) hadn't been

**4. Употребите нужную форму сослагательного наклонения в главном предложении:**

1. She .....glad if you called her tomorrow.  
a) will be      b) would be      c) should be

2. I.....you as I promised to do, if I had not lost your inviting card with your telephone number.
  - a) called
  - b) would call
  - c) should have called
3. If he had a lot of money, he .....a Mercedes.
  - a) will buy
  - b) would buy
  - c) had bought
4. If you hadn't been late for the lecture, you .....this information.
  - a) would hear
  - b) would have heard
  - c) should have heard

**5. Поставьте глагол в скобках в нужную форму сослагательного наклонения:**

1. If I (to be) you, I (to listen) to some good advice.
2. I (to read) the book long ago if I (to borrow) it from the library, but the book was not available.
3. If the weather (to be) fine, she (to join) us and (to go) to the country next Sunday.
4. The experiment (to give) good results if we (not to use) the old method of testing. Next time, let us make it again under different conditions.
5. I (to come) to the party if I (to be informed) of it in advance.
6. David is overweight. If he (not to eat) too much for his supper, he (not to gain) his weight.
7. I cannot call him so often. If I (to be acquainted) with him, I (not to feel) awkward about doing it.
8. If I (to have) a car, I (to drive) it carefully.
9. Why didn't you come to the railway station to see him off? – I did not know of his leaving for Moscow. If I (to know), I (to come).
10. He (to have a rest) in Florida if he (to buy) a cottage on Miami Beach. We'll live and see, maybe he will buy a house there.

**6. Перепишите и переведите следующие предложения, принимая во внимание многозначность английских глаголов *should* и *would*:**

1. He should understand the operation of a transistor.
2. It is necessary that the instrument should be sensitive.
3. If the Earth were perfectly spherical, it would be much easier to compute satellite orbits.
4. The experiment requires that all measurements should be accurate.
5. Without electronic computers it would be very difficult to observe man-made satellites.
6. We assumed that certain processes would take place instantaneously in the vicinity of a junction.
7. If we became familiar with the mechanism of charges transitions, we should understand the operation of a junction diode.
8. Some years ago pilots would fly only in good weather.
9. It should be mentioned that many physical and chemical processes result in the emission of light.
10. I should prepare everything necessary for the experiment.

**7. Перепишите и письменно переведите данные ниже предложения, учитывая особенности перевода зависимого и независимого причастного оборота:**

1. The temperature being increased, the resistivity of the semiconductor decreases. 2. The students were heard speaking about the results of their last test. 3. All the necessary preparations having been done, the lab technician began testing the operating parameters of a radio receiver. 4. Having been asked for such a book, the librarian promised to look for it. 5. When working in the laboratory, the engineer obtained very important data for his investigation. 6. When being in motion, the motor rotates the disk. 7. With pure aluminum having a comparatively low strength, duralumin is generally used in the aircraft industry. 8. The acid tank was made of steel, lead having been used as a lining. 9. The demands for instant data growing, the use of electronic computer systems increases. 10. A great number of operations are available with Pascal, bit manipulation being one of them. 11. Computers handling large amounts of information rapidly and accurately, the future of the world may be described in a very short phrase "computer and change". 12. We can widely use computers to give the automatic solution, quite a little probability of error being possible.

**8. Перепишите и письменно переведите следующие предложения, принимая во внимание, что инфинитив в конструкциях *Complex Object* и *Complex Subject* часто соответствует придаточным предложениям в русском языке:**

A. 1. One cannot expect the computer to think like a human being. 2. We need a signal to detect the direction of data flow because we want the computer to receive as well as transmit data. 3. We know the market for instrumentation, both analog and digital, to grow at a rapid rate. 4. One can watch more and more people move into biology from other areas of research. 5. We know electron to travel from the cathode to the anode. 6. New techniques allowed the properties of this substance to be changed. 7. Newton considered momentum to be the measure of quantity of motion. 8. Science has shown the electron to be a peculiar combination of mass and electrical charge.

B. 1. All the students are supposed to know Newton's law of mechanics. 2. The results of the tests have been found to be interesting. 3. Solar cells are known to find application in space flights. 4. This substance may be

assumed to be compound. 5. He seems to know a great deal about the history of radio engineering. 6. These two scientists happened to work at the same problem. 7. The computing center is reported to maintain extensive scientific contacts with other institutes and organizations. 8. Semiconductors are known to have a crystalline structure.

**9. Перепишите и письменно переведите предложения, содержащие конструкции с герундием:**

1. Her father will never give her consent to her marrying such a young man. 2. Everything depends on his being admitted to the conference. 3. Mme Curie's having discovered radium enabled her to isolate radioactive elements. 4. Hardly a day passed without their thinking of a visit to the Russian Museum. 5. Don't mind my saying it. It's not a criticism. 6. It was one of the reasons for her cooking in the evenings like this, alone in the neat, silent apartment. 7. This will lead to avoiding us. 8. I disliked the idea of Uncle Percy's going to London without me.

**10. Перепишите следующие сложноподчиненные предложения, подчеркните в них придаточные и укажите, являются ли они дополнительными (Д) или определительными (О):**

1. The emission from an X-ray tube of the kind we have described consists largely of continuous radiation. 2. We know this type of cathode has greater emission efficiency. 3. These three factors we have spoken about are the tube characteristics. 4. The design we used will cause an increase in collector current. 5. We know the germanium use in those rectifiers is not completely pure. 6. The paper he has read concerns crystals. 7. Professor asked us what we thought of this new method of calculation.

**11. Перепишите и письменно переведите на русский язык приводимый ниже текст**

Unlike children computers do exactly what they are told. This may sound like a good thing, especially to those who are about to use computers for the first time. But a bit of experience, with computers or even with children, is enough to demonstrate otherwise.

Having a child do exactly what you say is not the same as having a child do exactly what you mean. Most of us have experience impish children who respond to instructions by choosing the most literal interpretation. You tell them to jump into bed and they do, nearly breaking the springs. The

first few times a child does this sort of thing, it's cute. Thereafter, it's annoying and frustrating.

It's ironic but true that the computer's strict obedience to instructions is a constant source of frustration. The main reason is that your instructions don't always correspond to your intentions, but the computer goes right ahead and follows your instructions exactly. The result? Perhaps a cryptic error message, perhaps damaged information, perhaps a system crash.

### **Вариант 3**

**1. Перепишите и письменно переведите данные ниже предложения, учитывая особенности употребления сослагательного наклонения в английском языке:**

1. The scientists would test the equipment together with the representatives of the plant. 2. The delegation would arrive tomorrow but the weather is not good. 3. I should get in touch with him, but I am not sure if he has come back. 4. They would telephone him more often and he would tell them the news. 5. We had to take a taxi lest we should be late for the performance. 6. It was important that he should make a report. 7. The father ordered that Peter should stay at home. 8. It is unusual that they should have forgotten to post the letter. 9. My parents suggest that I should spend the summer at the seaside. 10. He pretended to be ill lest he should participate in the conference. 11. He speaks English as if he were a foreigner. 12. He looks as though he had known it before. 14. We were going to the country and we wished the weather were fine.

**2. Перепишите и письменно переведите данные предложения, содержащие придаточные условные. Определите тип условного предложения (реальное или нереальное условие):**

1. The computer must be instructed in the program what to do if the answer of an intermediate calculation becomes zero. 2. If the values of current were known, the difference between hot and cold junctions could be calibrated on a meter scale. 3. Provided conduction for a lesser period of time were desired to satisfy a circuit requirements, a higher potential would be impressed on the control grid. 4. If life existed on Venus, we should know this. 5. Even if one of the engines had failed, the plane would have been able to continue the flight safely. 6. Could the acid be purified, the reaction would take place. 7. If the experiments start in time, the results will be by no means satisfactory. 8. Unless computer technology had been developed, space research would have never made such great progress. 9. The accuracy of the system would be considerably improved if signals were

transmitted on two or more frequencies simultaneously. 10. If you are my friend, you'll help me with my exam in Physics.

**3. Употребите нужную форму сослагательного наклонения в придаточном предложении:**

1. If the weather.....fine, they would go to the forest for mushrooms next week-end.  
a) will be                      b) has been                      c) were
2. Larry would write him, if he .....his address.  
a) has known                      b) knew                      c) knows
3. If he.....more spare time, he might have helped us.  
a) had                      b) has had                      c) had had
4. If he .....a warm coat yesterday, he wouldn't have caught cold.  
a) put on                      b) had put on                      c) should put on

**4. Употребите нужную форму сослагательного наклонения в главном предложении:**

1. If he had realized the danger, he .....away.  
a) would run                      b) would have run                      c) had run
2. If George went to the party, he .....Bell there.  
a) would see                      b) will see                      c) saw
3. Matthew .....the children alone for too long if it hadn't been so necessary to see the doctor.  
a) hadn't left                      b) wouldn't leave                      c) wouldn't have left
4. Phil .....if he had more money.  
a) will travel                      b) would travel                      c) would have travelled

**5. Поставьте глагол в скобках в нужную форму сослагательного наклонения:**

1. If you (to go) and (to live) in that country, you (to find) easier to learn the language.
2. If it (not to cost) so much she (to buy) that dress.
3. If I (to be) you, I (to do) this work yesterday.
4. If Bob (to know) she was here he (to tell) her everything.
5. If we (not to waste) so much energy, our resources (to last) longer.
6. Joan (to send) the telex if the manager (to ask) her to do it.
7. I (not to be) late for work yesterday if I (to have) an early night the day before yesterday.
8. If Jack (to buy) the car earlier, it (to cost) less than now.
9. If I (to know) that it was going to rain, I (to take) an

umbrella. 10. Just imagine what the world (to be) like if we (not to have) electricity!

**6. Перепишите и переведите следующие предложения, принимая во внимание многозначность английских глаголов *should* и *would*:**

1. It is desirable that the arrangement of instruments should be as compact as possible. 2. The scientists suggested that the thickness of the wing should be moderate. 3. Should the atom gain an excessive electron, the problem would be solved. 4. The earliest experiments in the air showed that success would be achieved. 5. At the moment this class of instruments is mainly used in laboratory, but in future it should find use in industry. 6. Air is a medium through which sound travels, without it there would be no sound. 7. It should be emphasized that progress is made by people. 8. Magnetic measurements near or on asteroids would have been of value. 9. Early planes would carry only a pilot. 10. Reliability would be much higher if better circuits were employed.

**7. Перепишите и письменно переведите данные ниже предложения, учитывая особенности перевода зависимого и независимого причастного оборота:**

1. Any numerical problem being solved, the digital computer has become a significant instrument in our days. 2. A lot of information being delivered, some form of "memory" must be provided. 3. New computers are rapidly developed, digital computers being among the most widely spread. 4. Some mathematical problems being solved, we have to substitute the numbers for letters in formulas. 5. When falling, the more massive bodies have more inertia to overcome. 6. When using a computer, we can perform any information-processing task. 7. For systems requiring lower performance there is a choice: a choice of technology and a choice of design. 8. The rate of change of silicon technology is so fast that making a choice is like trying to hit a moving target; the parameters are continually but predictably changing with the technology advancing all the time. 9. Nearly all components and interconnections for data-processing equipment are fabricated by automated printing techniques, with the information for the manufacturing data being in digital form. 10. While used, precision instruments require very delicate handling. 11. There are several different types of mixtures, some being homogeneous and others heterogeneous. 12. The experiments having been carried out, we started new investigation.

**8. Перепишите и письменно переведите следующие предложения, принимая во внимание, что инфинитив в конструкциях *Complex Object* и *Complex Subject* часто соответствует придаточным предложениям в русском языке:**

A. 1. We believe these rectifiers to have been provided with filters. 2. These substances cause the composition of the liquid to be changed. 3. Friction caused the body to stop. 4. He assumed these vacuum tubes to have been tested under severe conditions. 5. The engineers consider most tubes of this type to use mercury vapour as the gas. 6. The ancients thought electricity to be an invisible fluid. 7. I want him to compare the results of his experiments on sensitivity of instruments. 8. We suppose them to know the fundamental laws of electricity.

B. 1. Computing machines in general are expected to perform arithmetic operations. 2. A computer is said to be universal or general purpose when it can be programmed to solve a wide variety of problems. 3. Copper wire is known to be highly durable under ordinary atmospheric conditions. 4. The methods described below are thought to be of interest. 5. The weather is likely to change tomorrow. 6. He is certain to make a good report at the conference, as he has read a lot of technical journals. 7. The charge in the nucleus was found to be proportional to the atomic weight of each element. 8. Modern computers are believed to have storage capacities for hundreds of thousands numbers.

**9. Перепишите и письменно переведите предложения, содержащие конструкции с герундием:**

1. I said something about it being a bit late. 2. I can remember him teaching me to swim. 3. The fact that she was young didn't seem to be any excuse at all for her not being like other women. 4. I cannot remember my father having talked of the book. 5. It was one of the reasons for my not having definitely refused the offer. 6. Also there was a possibility of your running into Ann. 7. Do you mind me asking you about work? 8. The next moment I was conscious of James shaking my hand.

**10. Перепишите следующие сложноподчиненные предложения, подчеркните в них придаточные и укажите, являются ли они дополнительными (Д) или определительными (О):**



1. We may expect a short circuit results in wire fault and cable fault.
2. The device involving diodes is limited in the variety of functions it can produce.
3. We know the current is a path of an electric current.
4. The method you have described has some advantages.
5. We learned quite recently the instrument was not of the highest quality.
6. Some of the properties, which we now associate with semiconductors, have been known for a century or more.
7. Some of the main reasons for the growth of integrated circuits are that they are small and light, more reliable than discrete circuits, have fewer connections, can be mass-produced and therefore are cheap.

**11. Перепишите и письменно переведите на русский язык приводимый ниже текст**

Expert systems technology is in its infancy, emerging from the new and expanding field of Artificial Intelligence (AI). There are two contrasting views of AI. One, the theoretical viewpoint, is concerned with understanding how computers can be developed to perceive and understand to the level of human ability. The other, the engineering viewpoint, is concerned with developing computers that can demonstrate human ability without requiring theoretical foundation. Just as it was possible to construct bridges before a science of mechanics was well developed, so too it is possible to develop intelligent systems that can contribute to problem solving and decision making before a comprehensive theoretical foundation has been developed.

The major AI areas mirror human abilities: locomotion and manipulatory skills in robotics; communication skills in natural language and speech; the ability to distinguish and recognize images in vision, and problem solving skills in expert systems.

AI techniques used can be classified into several areas: knowledge representation and processing, learning techniques, planning strategies and the user interface.

**ТЕКСТЫ**  
**ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ**  
**ДЛЯ СТУДЕНТОВ 1 КУРСА**

**Text 1. Types of Electric Current**

The electric current was born in the year 1800 when A. Volta constructed the first source of continuous current. Since that time numerous scientists and inventors, Russian and foreign, have contributed to its development and practical application. According to<sup>1</sup> electronic theory it is the electron that sets up a flow of electric current. In other words an electric current is a flow of electrons in a circuit per second of time. The flow of electricity through a circuit is called the electric current and is measured in amperes. The instrument for measuring electric current is called an ammeter.

The electric current flows in circuits formed of metallic conductors. Sometimes the circuit includes, in addition to<sup>2</sup> metal conductors, electrolytes (as in batteries), gaseous conductors (as in fluorescent lamps), and streams of electrons and ions (as in electric tubes). In all these cases the passage of the current results in the production of heat and light, or both and in the case of electrolytes it causes chemical changes.

There are different types of current having great importance for our industry, but we shall discuss only some of them. An electric current, which always flows in the same direction through a conductor and does not change its polarity, is called a direct current (d.c. or D.C.). A direct current generally remains at constant voltage, that is, the voltage neither rises nor falls. A pulsating direct current is that kind of electric current that flows in the same direction through a circuit but varies in its voltage value.

An alternating current is an electric current, alternating or varying both in amount and direction, its abbreviation is A.C. The alternation may occur (take place) from a few per second up to several million per second. Two alternations make a cycle. The number of cycles in one second is called the frequency of an alternating current.

An oscillating current is similar to A.C. in shape but has a constant frequency and its amplitude is damped. Transient currents usually damp away extremely rapidly. One should mention unidirectional transient and A.C. transient types of electric current.

(1800 t.un.)

<sup>1</sup> according to – согласно, в соответствии с.

<sup>2</sup> in addition to – кроче.

### **Text 2. Sources of Electrical Energy**

To produce an electric current requires employing a chemical, as in the battery, or a mechanical, as in the electromagnetic generator, source of energy.

Energy is not created by an electric energy source, but is only converted into an electrical form from another one, such as mechanical, chemical, thermal or radiant energy. In waterpower plants, the energy of falling water is converted into electrical or into heat when coal is burnt. Chemical sources of current have limited application as great quantities of electric energy generated today come from various forms of mechanical energy.

For the first time mechanical energy was converted into electrical one by means of electrostatic machines. As industrial application of energy increases greater amount of energy is needed every year. The energy needs will continue to grow while the energy sources of the world are decreasing.

Coal oil and gas have been man's main sources of heat from ancient times and today they are our basic sources of energy. However, coal and other kinds of fuel are often replaced by atomic energy. Man has learned to split atoms with the help of a nuclear reactor in order to get great quantities of energy. For example, a ton of uranium can give us as much energy as about 3 million tons of coal.

The Earth contains inside it a practically inexhaustible supply of thermal energy, which can be used for economic needs.

Another unlimited source of energy is the Sun. But at present only a small part of solar energy is being used. Solar power station will permit to generate cheap electricity in large quantities in the near future.

An enormous energy of the wind, exceeding millions of kilowatt-hours, has not yet found effective application. Utilization of tidal energy has been studied in many countries. Using tidal forces and wind energy will certainly make considerable contribution to future electricity production.

(1605 t.un.)

### **Text 3. Properties of Electric Current and Electric Circuit**

The flow of electrons through a circuit is called electric current. The strength of the current depends on the rate at which electrons move in the conductor. But we cannot see the effect produced by the electric current

apart from<sup>1</sup> the conductor through which it flows. If a magnet is suspended near a conductor carrying current, the magnet will deflect. Any piece of iron put near a conductor will become magnetized. A body carrying electric current becomes magnetized. Thus, to deflect a magnet, to magnetize iron and to heat the body are properties of electric current.

The properties influencing the flow of electricity in the circuit are resistance, inductance and capacitance.

**Resistance** is a property of a circuit to oppose the flow of electricity through it. The resistance of a conductor to the flow of electric current depends on a number of factors. First of all<sup>2</sup> that is the material of the conductor. Different materials offer different resistance to the flow of current. Metals generally have resistance and are good conductors. Materials, which offer a very high resistance, are used as insulators. Resistance is also affected by the length of the conductor. The longer the conductor, the greater is the resistance. The unit of resistance is the Ohm.

**Inductance** shows the ability of an electric current to create a magnetic field. If the current is alternating, the magnetic field formed by this current produces in the circuit the current of self-induction, which flows in the direction opposite to that of the current in this electric circuit. Inductance depends on the properties of the core and the structure of the coil. The unit of inductance is the Henry.

**Capacitance** is the property of the electric circuit to store electricity. The device designed to store electric charges is called a condenser or a capacitor. The capacitance of that condenser depends on the area of the plates, the distance between the plates and the nature of dielectric insulating the plates. Capacitance is measured in Farads.

(1735 t.un.)

<sup>1</sup> apart from – вне

<sup>2</sup> first of all – прежде всего

#### **Text 4. Elements of Electric and Radio Circuits**

An electric circuit is a path along which electricity can flow. An electric circuit consists of a source of energy or power source, a receiver of energy and two conductors connecting the receiver and the power source terminals. The electric source produces the necessary electromotive force (e.m.f.) required for the flow of current through the circuit. The circuit should be complete; otherwise no electric current can flow through it. If the circuit is broken or “opened”, the

Fundamentally, two types of circuits are possible, according to the way in which the circuit elements are joined. To understand the difference between the circuit connections is not difficult. When electrical devices are connected one after another so that the current flows successively through each element, we say they are connected in series. Under such conditions the current flow is the same in all parts of the circuit, as there is only a single path along which it may flow. The electric bell circuit is a typical example of a series circuit.

The parallel circuit provides two or more paths for electric current. The parallel circuit elements are connected side by side<sup>1</sup> in such a way<sup>2</sup> that the total current flowing through the circuit is the sum of currents flowing through each circuit element individually. The lamps in your room are generally connected in parallel.

Any radio circuit is an electric circuit including radioelements. Radio differs from other means of communication in the means used to connect the transmitting and receiving points. The basic elements of any radio system are a transmitter used for generating radio frequency, a modulator used for impressing intelligence upon the carrier, and a transmitting antenna used for radiating the modulated carrier wave. At the receiving end there must be a receiving antenna, a receiver and a loudspeaker.

(1640 t.un.)

<sup>1</sup> side by side – рядом

<sup>2</sup> in such a way - таким образом

### **Text 5. From the History of Electricity**

Do you know that the first ever man-made electric light illuminated the laboratory of the St. Petersburg physicist Vasily Petrov in 1802? He had discovered the electric arc, a form of the gas discharge. But in Petrov's experiments the arc flame lasted for only a short time.

In 1876 Pavel Yablochkov invented an arc that burned like a candle for a long time and it was called "Yablochkov's candle". The source of light invented by Yablochkov won worldwide recognition. But while he and several other inventors were improving the arc light, some engineers were working along entirely different lines. They sought to develop an incandescent lamp<sup>1</sup>. It was a young Russian engineer, Alexander Lodygin, who made the first successful incandescent lamp. The famous American

inventor Thomas Edison improved the lamp having used a carbon filament. But it was again Lodygin who made another important improvement in the incandescent lamp, having invented a lamp with a tungsten filament, the lamp we use today.

Automation, which is one of the main factors of technical progress today, is impossible without electricity.

Our life cannot be imagined without telephone, telegraph and radio communications. But it is also electricity that gives them life. In recent years electricity has made a great contribution to radio communication between the spaceships and also between the astronauts and the earth.

Little could be done in modern research laboratory without the aid of electricity. Nearly all of the measuring devices used in developing nuclear power for the use of mankind are electrically operated.

(1350 t.un.)

<sup>1</sup> incandescent lamp – лампочка накаливания

#### **Text 6. Radar**

The word “radar” is an abbreviation for the phrase “radio detection and ranging”, that is, the use of radio waves to detect the presence and determine the precise position of any stationary or moving object capable of reflecting them. Radio waves can be reflected by large solid objects in much the same manner as light. They are, however, able to travel greater distances than light in the Earth’s atmosphere, because they are not reflected or diffused by small dust particles in the atmosphere. Radar works on the so-called “echo” principle. It sends out radio waves and then measures the amount of time that it takes the waves to return.

Radar set includes a transmitter and a receiver. If a transmitter sends out a beam of waves, an adjacent receiver operating like a television receiver translates the echoed radio waves into a kind of picture. These radio waves can penetrate clouds and sea depths. They continue to move out in a straight line from a transmitter until they strike something solid. Then they are reflected back. The reflected waves moving back to the radar set are received and translated into a tiny spot on the cathode-ray-tube screen or display. The display may resemble a map of the surroundings and the objects are as bright spots on a dark background.

The most important uses of radar are known to be in ship and air navigation. Radar set on board a ship can provide the captain with complete information about the objects around the ship. It will show the distances

and positions of other ships, islands or land so that a safe course can be steered.

There are many types of radar intended for use on ships and planes. The electrical features of radar for use in airplanes are similar to those used on ships. Special types of radar provide air-traffic control, “blind landing” and ground-controlled approach.<sup>1</sup> Radar provides information for meteorology and astronomy, such as detecting meteors and studying cosmic environments.

(1634 t.un.)

<sup>1</sup> ground-controlled approach – наземное управление при заходе на посадку

**ТЕКСТЫ  
ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ  
ДЛЯ СТУДЕНТОВ 2 КУРСА**

**FROM THE HISTORY OF COMPUTERS**

The introduction of agriculture revolutionized ancient man’s social, economic, and cultural potential. This was the first great step in the evolution of civilization. The more recent Industrial Revolution, vastly increasing man’s productive capabilities, was the next great step and brought forth our present highly mechanized economic and interdependent social civilization.

Nowadays we have another new kind of revolution, based on machines that greatly increase man’s thinking capabilities of planning, analyzing, computing, and controlling. Hundreds of millions of computers are already in daily use penetrating almost all spheres of our modern society, from nuclear energy production and missile design to the processing of bank checks and medical diagnoses.

The development of mechanical calculating machines made the digital computers necessary. An ordinary arithmometer and a desk key calculator have given rise to electronic digital computers. Digital computers came into being in the first half of the 17<sup>th</sup> century. Many outstanding Russian and foreign mathematicians of that time created mechanical calculating devices.

The famous Russian scientist M.V. Lomonosov compiled a lot of calculating tables and several computing devices concerning different fields of science and engineering.

In 1874 the Russian engineer V.T. Odner invented a special counter wheel<sup>1</sup> named after him the Odner's wheel, which is used in modern arithmometers and calculators.

P.L. Chebyshev, academician, made a valuable contribution to the field of computing machines. He is known<sup>2</sup> to have many good ideas in mathematics, some of which have been named after him. For example, the Chebyshev's polynomials play a unique role in the field of orthogonal functions. In 1878 he constructed an original computing machine, which was exhibited in Paris. In 1882 P.L. Chebyshev invented an arithmometer performing automatically multiplication and division. The automation principle put into this computing machine is still widely used all over the world for developing modern computers.

In 1884 Russia began manufacturing computing machines. During World War I the output of computing machines was stopped but soon it continued.

At the end of the 1930s computing engineering began the new era. There appeared computers operating at high speed. The rapid advance of computers resulted from the success achieved by electronics. There appeared a possibility to solve complex mathematical problems within an unusually short time. Modern engineering enables to do the amount of calculations and researches within a very short period of time, which would have required years of laborious work of large groups of people before<sup>3</sup>.

The first electronic digital computer was developed in Russia under the supervision of S.A. Lebedev in 1950. Then, in 1953 BESM (High-Speed Electronic Computer) was designed by the Academy of Sciences. This machine could perform about 250 million operations. A human being could do this work during 300 years of continuous labour.

BESM was followed by a number of large-, medium-, and small-size general and special purpose computers<sup>4</sup>. It was the first generation of computers constructed on electronic tubes.

The second-generation computers were solid-state large-powered machines.

Computers made on integrated circuits containing hundreds of thousands of active electronic devices in tiny elements are of the third and fourth generations.

Computers of the fifth generation contain high-level user interfaces based on VLSI and SLSI<sup>5</sup>, optical fibers, videodisks, and artificial intelligence<sup>6</sup> approaches for interaction via natural languages, including speech input.



A major advance in the development of computer technologies was the creation of microprocessors and microcomputers. These tiny computer devices are able to control complex operations.

So we see that the significance of the electronic computers invention can be compared with the invention of the steam engine at the end of the 18<sup>th</sup> century and the utilization of atomic energy.

(3 470 t.un.)

NOTES: <sup>1</sup>a special counter wheel – специальное счетное колесо

<sup>2</sup> He is known to.... – известно, что он .....

<sup>3</sup> which would require years of laborious work of large groups of people before – которые потребовали бы раньше годы трудоемкой работы большой группы людей

<sup>4</sup> general and special purpose computers – универсальные и специализированные компьютеры

<sup>5</sup> VLSI (Very Large-Scale Integration) – интеграция очень высокого уровня, SLSI (Super Large-Scale Integration) – интеграция сверх высокого уровня

<sup>6</sup> artificial intelligence - искусственный интеллект

### COMPUTER AS A CONCEPT

In the developed world of the 20<sup>th</sup> century, man lives surrounded by a bewildering variety of machines on which his way of life and even life itself depends. These machines can be simple or complex, minute or enormous. Some, like a sewing machine, are for specific applications while other, like electric drill, can be used for a variety of purposes. Some machines, though designed for a specific purpose, are components in many different machines; for instance, the electric motor gives the electric drill its flexibility. This is because the purpose of the motor – to provide power – is fundamental in many applications.

Another fundamental aspect of twentieth-century life is the vast amount and variety of information that surrounds man from media such as the telephone and radio. This has transformed everyday life as much as engines and motors. There are many machines developed to handle the information, for example television cameras to record pictures, transmitters to send these pictures to television receivers in people's homes.

The ease of using machines also varies and is not always related to their complexity. For example, some, like refrigerators, can work untended, and little skill or training is required to use a television set or a tin-opener; whereas considerable aptitude, instruction and practice is needed to fly an

airplane or use a potter's wheel. The amount of skill and training required might depend on the circumstances of use – driving a motorcar on a country road is a skill relatively easily acquired compared to driving a racing car on a grand prix circuit. Knowledge of the principles behind the operation of a machine may be useful. It is possible to drive a car without knowing anything about what happens under the bonnet, although one can probably drive better for knowing something about mechanics.

Computers are machines, which handle information, and they are based on relatively simple principles. Knowledge of these principles helps one to understand computers and make better use of them.

Computers which deal with numerical information can be divided into three classes: (1) digital, in which the representation of numbers and the calculations on them are performed by counting processes (e.g. by counting teeth on gear wheels or counting electrical impulses); (2) analogue, in which the representation of numbers and the calculations on them are performed by measuring processes (e.g. in electronic computers by measuring voltages); and (3) hybrid, in which both kinds of process are used. Nowadays the word computer, unless qualified, normally means 'electronic digital computer'; 'electronic' because in most computers electronic processes have replaced all others because of their speed, reliability and cheapness, "digital" because the exactness of digital processes implies a greater potential for accuracy.

(2430 t.un.)

### **THE INTERNET**

The Internet, a global computer network that embraces millions of users all over the world, began in the US in 1969 as a military experiment. It was designed to survive a nuclear war. Information sent over the Internet takes the shortest path available from one computer to another. Because of this, any two computers on the Internet will be able to stay in touch with each other as long as there is a single route between them.

Most of the Internet host computers (more than 50%) are in the US, while the rest are located in more than 100 other countries. Although the number of host computers can be counted fairly accurately, nobody knows exactly how many people use the Internet, there are millions, and their number is growing.

The most popular Internet service is e-mail. Most of the people, who have access to the Internet, use the network only for sending and receiving

e-mail messages. However, other popular services are available on the Internet: reading USENET News, using the World-Wide Web, telnet, FTP, and Gopher.

In many developing countries the Internet may provide businessmen with a reliable alternative to the expensive and unreliable telecommunication systems of these countries. Commercial users can communicate over the Internet with the rest of the world and can do it very cheaply. When they send e-mail messages, they only have to pay the phone calls to their local service providers, not for calls across their countries or around the world. But who actually pays for sending e-mail messages over the Internet long distances, around the world? The answer is very simple: a user pays his/her service provider a monthly or hourly fee. Part of this fee goes towards its cost to connect to a larger service provider. And part of the fee got by the larger provider goes to cover its cost of running worldwide network of wires and wireless stations.

But saving money is only the first step. If people see that they can make money from the Internet, commercial use of this network will drastically increase. For example, some western architecture companies and garment centers already transmit their basic designs and concepts over the Internet into China, where they are reworked and refined by skilled – but inexpensive – Chinese computer-aided-design specialists.

However, some problems remain. The most important is security. When you send an e-mail message to somebody, this message can travel through many different networks and computers. The data is constantly being directed towards its destination by special computers called routers. Because of this, it is possible to get into any of computers along the route, intercept and even change the data being sent over the Internet. In spite of the fact that there are many strong encoding programs available, nearly all the information being sent over the Internet is transmitted without any form of encoding, i.e. “in the clear”. But when it becomes necessary to send important information over the network, these encoding programs may be useful. Some American banks and companies even conduct transactions over the Internet. However, there are still both commercial and technical problems, which will take time to be resolved.

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### **A BOLD PLUNGE INTO THE DIGITAL YOUTH MARKET**

Samsung Electronics is keen to make a big splash in the Information Technology (IT) world. It has a number of new digital consumer products

and has plans for more. Many of them – incorporating multimedia, Internet and e-mail functions in small portable devices – are aimed at the young, whom the company regards as its market of the new future in the compressed timescale of the Internet age.

Samsung talks enthusiastically about generation Y (the 13 to 25 year-olds) and generation N (Internet consumers). Today's children, teenagers and students are the customers of the future, says Mt. Chin, chief technology officer and executive vice-president of Samsung Electronics. "When they grow up, they will really use our products. So we are actually searching for the needs, habits and tastes of this younger generation".

Mr. Chin sees the time when the PC will play a smaller role. "There will be an embedded computer somewhere. Internet connectivity can be achieved with many other products – mobile phones, PDAs (personal digital assistants), digital TVs. Even a microwave oven can be connected to the Internet".

Among the latest and planned offerings, mostly using Samsung's digital Smart Media card, area portable digital audio player using MP3 compression technology, as well as one for downloading music and videos; a digital photo album; a web pad for easy Internet and e-mail access; a web video phone, an e-diary with wireless access to the Internet; and the world's first watch phone. The new products represent, as Mr. Chin says, "a basic shift in strategy, demonstrating our deep conviction that digital connectivity is the future of our industry".

*(Information Technology, Financial Times Review, 2000)*

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