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МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
**ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
«ДОНСКОЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ»
(ДГТУ)
АВИАЦИОННЫЙ КОЛЛЕДЖ**

УТВЕРЖДАЮ
Директор колледжа
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личная подпись инициалы, фамилия
«24» 01 2020 г.
Рег. № _____

ФОНД ОЦЕНОЧНЫХ СРЕДСТВ
по дисциплине **ОГСЭ. 03 Иностранный язык в профессиональной
деятельности**
основной образовательной программы
по специальности СПО
15.02.15. Технология металлообрабатывающего производства

Ростов-на-Дону
2020 г.

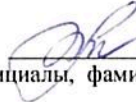
Лист согласования

Фонд оценочных средств по специальности (специальностям) среднего профессионального образования (далее - СПО) 15.02.15. Технология металлообрабатывающего производства разработан на основе Федерального государственного образовательного стандарта (далее – ФГОС)

Разработчик:

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«21» 01 2020г.

Фонд оценочных средств рассмотрен и одобрен на заседании цикловой комиссии «Общие гуманитарные и социально-экономические дисциплины»

Протокол № 5 от «21» 01 2020г.

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«21» 01 2020г.

1. Паспорт фонда оценочных средств

Фонд оценочных средств (ФОС) предназначены для контроля и оценки образовательных достижений обучающихся, освоивших программу учебной дисциплины «Иностранный язык в профессиональной деятельности».

ФОС включают контрольные материалы для проведения текущего контроля в форме проверочных работ и контрольных работ, рубежного контроля и промежуточной аттестации в форме зачета, дифференцированного зачета, итоговой контрольной работы.

В результате освоения учебной дисциплины «Иностранный язык в профессиональной деятельности» обучающийся должен обладать предусмотренными ФГОС по специальности 15.02.15. Технология металлообрабатывающего производства по следующими умениями и знаниями, которые формируют профессиональную компетенцию, и общими компетенциями:

- У1. понимать общий смысл четко произнесенных высказываний на известные темы (профессиональные и бытовые)
- У2. понимать тексты на базовые профессиональные темы
- У3. участвовать в диалогах на знакомые общие и профессиональные темы
- У4. строить простые высказывания о себе и о своей профессиональной деятельности.
- У5. кратко обосновывать и объяснить свои действия (текущие и планируемые)
- У6. писать простые связные сообщения на знакомые или интересующие профессиональные темы правила построения простых и сложных предложений на профессиональные темы

- З1. правила построения простых и сложных предложений на профессиональные темы
- З2. основные общеупотребительные глаголы (бытовая и профессиональная лексика)
- З3. правила чтения текстов профессиональной направленности
- З4. лексический минимум, относящийся к описанию предметов, средств и процессов профессиональной деятельности
- З5. особенности произношения

ОК 1. Понимать сущность и социальную значимость своей будущей профессии, проявлять к ней устойчивый интерес.

ОК 2. Осуществлять поиск, анализ и интерпретацию информации, необходимой для выполнения задач профессиональной деятельности

ОК 3. Планировать и реализовывать собственное профессиональное и личностное развитие.

ОК 4. Осуществлять поиск, анализ и оценку информации, необходимой для постановки и решения профессиональных задач, профессионального и личностного развития.

ОК 5. Осуществлять устную и письменную коммуникацию на государственном языке с учетом особенностей социального и культурного контекста.

ОК 6. Работать в коллективе и команде, обеспечивать ее сплочение, эффективно общаться с коллегами, руководством, потребителями.

ОК 9. Использовать информационные технологии в профессиональной деятельности

ОК 10. Пользоваться профессиональной документацией на государственном и иностранном языке.

Формой аттестации по УД является (итоговая) контрольная работа (4, 9 семестр), зачет (5, 6 семестр), дифференцированный зачет (7, 8 семестр).

2. Результаты освоения учебной дисциплины, подлежащие проверке

В результате аттестации по учебной дисциплине осуществляется комплексная проверка следующих умений и знаний, а также динамика формирования общих компетенций:

<i>Результаты обучения</i>	<i>Критерии оценки</i>	<i>Формы и методы оценки</i>
<i>уметь:</i> • понимать общий смысл четко произнесенных высказываний на известные темы	«Отлично» - теоретическое содержание курса освоено полностью, без пробелов, умения сформированы, все	Примеры форм и методов контроля и оценки • Компьютерное

<p>(профессиональные и бытовые),</p> <ul style="list-style-type: none"> • понимать тексты на базовые профессиональные темы • участвовать в диалогах на знакомые общие и профессиональные темы • строить простые высказывания о себе и о своей профессиональной деятельности • кратко обосновывать и объяснить свои действия (текущие и планируемые) <p>-писать простые связные сообщения на знакомые или интересующие профессиональные темы правила построения простых и сложных предложений на профессиональные темы</p> <p>знать:</p> <ul style="list-style-type: none"> • правила построения простых и сложных предложений на профессиональные темы • основные общеупотребительные глаголы (бытовая и профессиональная лексика) • лексический минимум, относящийся к описанию предметов, средств и процессов профессиональной деятельности • особенности произношения • правила чтения текстов профессиональной направленности 	<p>предусмотренные программой учебные задания выполнены, качество их выполнения оценено высоко.</p> <p>«Хорошо» - теоретическое содержание курса освоено полностью, без пробелов, некоторые умения сформированы недостаточно, все предусмотренные программой учебные задания выполнены, некоторые виды заданий выполнены с ошибками.</p> <p>«Удовлетворительно» - теоретическое содержание курса освоено частично, но пробелы не носят существенного характера, необходимые умения работы с освоенным материалом в основном сформированы, большинство предусмотренных программой обучения учебных заданий выполнено, некоторые из выполненных заданий содержат ошибки.</p> <p>«Неудовлетворительно» - теоретическое содержание курса не освоено, необходимые умения не сформированы, выполненные учебные задания содержат грубые ошибки.</p>	<p>тестирование на знание терминологии по теме;</p> <ul style="list-style-type: none"> •Тестирование •Контрольная работа •Самостоятельная работа. •Защита реферата •Семинар •Защита курсовой работы (проекта) •Выполнение проекта; •Наблюдение за выполнением практического задания. (деятельностью студента) •Оценка выполнения практического задания(работы) •Подготовка и выступление с докладом, сообщением, презентацией... •Решение ситуационной задачи
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3. Оценка освоения учебной дисциплины:

3.1. Формы и методы оценивания

Предметом оценки служат умения и знания, предусмотренные ФГОС по дисциплине «Иностранный язык в профессиональной деятельности», направленные на формирование общих и профессиональных компетенций.

4. Критерии оценки знаний по дисциплине иностранный язык:

4.1. Критерии оценки по составлению диалогов

Высокую положительную оценку «5» студент получает, если:

- достаточно полно и конструктивно излагает соответствующую тему;
- дает правильные формулировки, точные определения, понятия терминов;
- грамотно отвечает на дополнительные вопросы преподавателя

Положительную оценку «4» студент получает, если:

- если при изложении были допущены 1-2 незначительные ошибки, которые студент исправляет после замечания преподавателя;
 - правильно отвечает на дополнительные вопросы преподавателя
 - излагает выполнение задания недостаточно логично и последовательно;
 - затрудняется при ответах на вопросы преподавателя.
 - Неполно изложено задание;
- Удовлетворительную оценку «3» студент получает, если:
- при изложении были допущены значительные ошибки
 - неверно отвечает на дополнительные вопросы преподавателя
 - излагает выполнение задания нелогично и непоследовательно;

4.2. Монологическая форма

Оценка	Характеристика ответа
5	Учащийся логично строит монологическое высказывание в соответствии с коммуникативной задачей, сформулированной в задании. Лексические единицы и грамматические структуры используются уместно. Ошибки практически отсутствуют. Речь понятна: практически все звуки произносятся правильно, соблюдается правильная интонация. Объем высказывания не менее нормы.
4	Учащийся логично строит монологическое высказывание в соответствии с коммуникативной задачей, сформулированной в задании. Лексические единицы и грамматические структуры соответствуют поставленной коммуникативной задаче. Учащийся допускает отдельные лексические или грамматические ошибки, которые не препятствуют пониманию его речи. Речь понятна, учащийся не допускает фонематических ошибок. Объем высказывания не менее нормы.
3	Учащийся логично строит монологическое высказывание в соответствии с коммуникативной задачей, сформулированной в задании. Но высказывание не всегда логично, имеются повторы. Допускаются лексические и грамматические ошибки, которые затрудняют понимание, Речь в целом понятна, учащийся в основном соблюдает правильную интонацию. Объем высказывания - менее нормы.
2	Коммуникативная задача не выполнена. Допускаются многочисленные лексические и грамматические ошибки, которые затрудняют понимание. Большое количество фонематических ошибок.

4.3. Чтение с пониманием основного содержания прочитанного (ознакомительное)

Оценка «5» ставится учащемуся, если он понял основное содержание оригинального текста, может выделить основную мысль, определить основные факты, умеет догадываться о значении незнакомых слов из контекста, либо по словообразовательным элементам, либо по сходству с родным языком. Скорость чтения иноязычного текста может быть несколько замедленной по сравнению с той, с которой ученик читает на родном языке. Заметим, что скорость чтения на родном языке у учащихся разная.

Оценка «4» ставится ученику, если он понял основное содержание оригинального текста, может выделить основную мысль, определить отдельные факты. Однако у него недостаточно развита языковая

догадка, и он затрудняется в понимании некоторых незнакомых слов, он вынужден чаще обращаться к словарю, а темп чтения более замедлен.

Оценка «3» ставится школьнику, который не совсем точно понял основное содержание прочитанного, умеет выделить в тексте только небольшое количество фактов, совсем не развита языковая догадка.

Оценка «2» выставляется ученику в том случае, если он не понял текст или понял содержание текста неправильно, не ориентируется в тексте при поиске определенных фактов, не умеет семантизировать незнакомую лексику.

4.4. Чтение с полным пониманием содержания (изучающее)

Оценка «5» ставится ученику, когда он полностью понял несложный оригинальный текст (публицистический, научно-популярный; инструкцию или отрывок из туристического проспекта). Он использовал при этом все известные приемы, направленные на понимание читаемого (смысловую догадку, анализ).

Оценка «4» выставляется учащемуся, если он полностью понял текст, но многократно обращался к словарю.

Оценка «3» ставится, если ученик понял текст не полностью, не владеет приемами его смысловой переработки.

Оценка «2» ставится в том случае, когда текст учеником не понят. Он с трудом может найти незнакомые слова в словаре.

4.5. Чтение с нахождением интересующей или нужной информации (просмотровое)

Оценка «5» ставится ученику, если он может достаточно быстро просмотреть несложный оригинальный текст (типа расписания поездов, меню, программы телепередач) или несколько небольших текстов и выбрать правильно запрашиваемую информацию.

Оценка «4» ставится ученику при достаточно быстром просмотре текста, но при этом он находит только примерно 2/3 заданной информации.

Оценка «3» выставляется, если ученик находит в данном тексте (или данных текстах) примерно 1/3 заданной информации.

Оценка «2» выставляется в том случае, если ученик практически не ориентируется в тексте.

4.6. Контроль техники чтения

Критерии	Оценка
Речь воспринимается легко: необоснованные паузы отсутствуют; фразовое ударение и интонационные контуры, произношение слов практически без нарушений нормы; допускается не более 2-х фонетических ошибок	5
Речь воспринимается достаточно легко, однако присутствуют необоснованные паузы; фразовое ударение и интонационные контуры практически без нарушений нормы; допускается от 3 до 5 фонетических ошибок, в том числе 1-2 ошибки, искажающие смысл	4
Речь воспринимается достаточно легко, однако присутствуют необоснованные паузы; есть ошибки в фразовых ударениях и интонационных контурах; допускается от 5 до 7 фонетических ошибок, в том числе 3 ошибки, искажающие смысл	3
Речь не воспринимается из-за необоснованных пауз; неправильных фразовых ударений и искаженных интонационных контуров ИЛИ 8 и более фонетических ошибок	2

4.7. Контроль письменного высказывания: Письмо, сочинение

Критерии: решение коммуникативной задачи (содержание) и организация высказывания, языковое оформление высказывания

За письменное высказывание выставляется 2 оценки по двум критериям. Решение	Организация текста	Оценка
Задание выполнено полностью. Допустим один недочет Правильный выбор стилового оформления речи	Высказывание логично. Текст разделен на абзацы Структура текста соответствует заданию Используются средства логической связи Возможен недочет в одном из	5
Задание выполнено не полностью. Имеются 2-3 недочета. Есть недочеты в стиливом оформлении речи	Высказывание логично. Текст разделен на абзацы Структура текста соответствует заданию Используются средства логической связи Возможен недочет в одном из	4
Задание выполнено частично. Есть серьезные ошибки в содержании Не соблюдается стиливое оформление	Высказывание логично. Текст разделен на абзацы Структура текста соответствует заданию Используются средства логической связи Возможен недочет в одном из	3
Задание не выполнено. Коммуникативная задача не решена .	Высказывание логично. Текст разделен на абзацы Структура текста соответствует заданию Используются средства логической связи Возможен недочет в одном из	2
Задание выполнено полностью. Допустим один недочет Правильный выбор стилового оформления речи	Высказывание логично. Текст разделен на абзацы Структура текста соответствует заданию Используются средства логической связи Возможен недочет в одном из аспектов В 2-3 аспектах есть недочеты	4
Задание выполнено не полностью. Имеются 2-3 недочета. Есть недочеты в стиливом оформлении речи	Высказывание логично. Текст разделен на абзацы Структура текста соответствует заданию Используются средства логической связи Возможен недочет в одном из	3
Задание выполнено частично. Есть серьезные ошибки в содержании Не соблюдается стиливое оформление	Высказывание нелогично Нет разбивки на абзацы Структура не соответствует заданию Неправильно используются средства логической связи	2

Письменные работы

(контрольные работы, самостоятельные работы, словарные диктанты) оценка вычисляется исходя из процента правильных ответов.

Виды работ	Оценка «3»	Оценка «4»	Оценка «5»
Контрольные работы	От 50% до 69%	От 70% до 90%	От 91% до 100%
Самостоятельные работы, словарные диктанты	От 60% до 74%	От 75% до 94%	От 95% до 100%

Творческие письменные работы

(письма, разные виды сочинений) оцениваются по пяти критериям:

а) Содержание (соблюдение объема работы, соответствие теме, отражены ли все указанные в задании аспекты, стилевое оформление речи соответствует типу задания, аргументация на соответствующем уровне, соблюдение норм вежливости).

ПРИ НЕУДОВЛЕТВОРИТЕЛЬНОЙ ОЦЕНКЕ ЗА СОДЕРЖАНИЕ ОСТАЛЬНЫЕ КРИТЕРИИ НЕ ОЦЕНИВАЮТСЯ И РАБОТА ПОЛУЧАЕТ НЕУДОВЛЕТВОРИТЕЛЬНУЮ ОЦЕНКУ;

б) Организация работы (логичность высказывания, использование средств логической связи на соответствующем уровне, соблюдение формата высказывания и деление текста на абзацы);

в) Лексика (словарный запас соответствует поставленной задаче и требованиям данного года обучения языку);

г) Грамматика (использование разнообразных грамматических конструкций в соответствии с поставленной задачей и требованиям данного года обучения языку);

д) Орфография и пунктуация (отсутствие орфографических ошибок, соблюдение главных правил пунктуации: предложения начинаются с заглавной буквы, в конце предложения стоит точка, вопросительный или восклицательный знак, а также соблюдение основных правил расстановки запятых).

Оценка «зачтено» выставляется студенту, который прочно усвоил предусмотренный программный материал; правильно, аргументировано ответил на все вопросы, с приведением примеров; показал глубокие систематизированные знания, владеет приемами рассуждения и сопоставляет материал из разных источников: теорию связывает с практикой, другими темами данного курса, других изучаемых предметов; без ошибок выполнил практическое задание.

Обязательным условием выставленной оценки является правильная речь в быстром или умеренном темпе. Дополнительным условием получения оценки «зачтено» могут стать хорошие успехи при выполнении самостоятельной и контрольной работы, систематическая активная работа на семинарских занятиях.

Оценка «не зачтено» Выставляется студенту, который не справился с 50% вопросов и заданий билета, в ответах на другие вопросы допустил существенные ошибки. Не может ответить на дополнительные вопросы, предложенные преподавателем. Целостного представления о взаимосвязях, компонентах, этапах развития культуры у студента нет. Оценивается качество устной и письменной речи, как и при выставлении положительной оценки.

Контрольная работа 4 семестр
по дисциплине ОГСЭ. 03 Иностранный язык в профессиональной
деятельности специальность: 15.02.15 Технология металлообрабатывающего
производства

1. Isabelle Dussart is waiting for her plane. Listen and complete the missing details.

TIME	DESTINATION	FLIGHT NO.	INFORMATION	GATE NO.
	Athens	BA 651	Boarding	
12.30	New York		Boarding	51
	Stockholm	SK 444	Boarding	
		IB 414	Boarding	40
			Delayed until 15.00	16

Вариант № 1

Задание 1. Вставить подходящее по смыслу слово.

At present the nature of ... is explained by the electron theory.

- a) electrification
- b) history
- c) town

2) Any instrument which measures electrical values is called

- a) atom
- b) a meter
- c) a battery

3) An Italian ... Volta made many experiments with electricity.

- a) musician
- b) driver
- c) scientist

Задание 2. Найдите русские эквиваленты.

- 1) sources of electrical energy
- 2) a capacitor is an electrical device
- 3) alternating current
- 4) positive electrode
- 5) measuring units and instruments
- 6) the ignition system of automobiles

Задание 3. Вставить правильную форму глагола.

- 1) The mechanic (is repairing / was repairing) the engine now.
- 2) He (measured, will measure) electrical power 2 hours ago.
- 3) A new power station (is built / will be built) in the nearest future.
- 4) Now all substances (is, are) good conductors of electricity.
- 5) Battery cells (have, has) dry cells and wet cells.

Задание 4. Сгруппировать синонимы

Different, not far, end, great, near, finish, various, huge, step up, increase, section, part, step down, decrease.

Задание 5. Найдите английские эквиваленты.

Электрический ток, проводник, вольтметр, сопротивление, медный провод, конденсатор, передача энергии, генератор.

Задание 6. Выберите правильный вариант.

1. Tell him not to forget ticket.
a) My b) our c) Her d) his
2. I see that he has lost ... keys.
a) Themselves b) ourselves c) His d) me
3. I will ask him
a) Myself b) herself c) Ourselves d) yourself
4. That is his manager, ...name is Jane.
a) Her b) his c) Us d) our
- 5) ... will help me?
a) Who b) when c) Why d) how
6. Do you know the man ... wrote the 8-DReport?
a) Who b) which c) Why d) how
7. Who's there? It's ...
Me b) you c) I d) her
8. The magazine ... you lent me is very interesting.
a) That b) this c) Those d) these
9. ... is a new Peugeot.
a) When b) why c) This d) where
10. My brother is a professional. ...repairs a lot of cars.
a) she b) he c) I d) him

Задание 7. Прочитайте текст. Ответьте на вопросы, данные к тексту.

A) Steels vary greatly but the major classes are carbon steels, low-alloy steels and high-alloy steels. Tool steels are special steels that are engineered to particular service requirements. These expensive alloys are exceptionally strong, hard, wear-resistant, tough, and nonreactive to local overheating. They contain tungsten, molybdenum, vanadium and chromium in different combinations, and often cobalt or nickel for better high-temperature performance. They are used for machine tools, aircraft undercarriages, in buildings and bridges.

1. What are the major classes of steel?
2. What is tool steel?
3. What characteristics do tool steels have?
4. What do they contain?
5. Where are they used?

B) The good news is that we will not run out of copper. The worldwide resources of this important and valuable metal can be estimated at nearly 5.8 trillion pounds of which only about 0.7 trillion have been mined throughout history. Besides, nearly all of 700 billion pounds is still in circulation because copper's recycling rate is higher than that of any other engineering metal. Each year nearly as much copper is recovered from recycled material as is obtained from newly mined ore. Almost half of all recycled copper scrap is old post-consumer scrap, such as discarded electric cable, junked automobile radiators and air conditioners, or even ancient Egyptian plumbing. Engineers hop that we will be able to use copper for centuries on.

1. What is the worldwide resource of copper?
2. How much copper is still in circulation?
3. What is the copper's recycling rate?
4. How much copper is recovered from recycled material?
5. What is old post-consumer scrap from which copper is recycled?

Вариант № 2

Задание 1. Вставить подходящее по смыслу слово.

A capacitor is used for storing

- a) petrol
 - b) electricity
 - c) meter
- 2) He ... the electric motor and the first telegraph.
- a) invented
 - b) printed
 - c) called

Задание 2. Найдите русские эквиваленты.

- 1) electrical current
- 2) electron theory
- 3) connected between the plates
- 4) conduct electricity
- 5) a container for storing electricity
- 6) transmission of electrical energy

Задание 3. Вставить правильную форму глагола.

- 1) The principles of the capacitor (are illustrated, was illustrated)
- 2) Faraday (carried out, will carry out) series of experiments in 1831.
- 3) The scientist Volta (faces, faced) the problem how electricity could be produced.
- 4) Some new instruments (will be made, are made) next month.
- 5) Newton (have expressed, has expressed) the connection between force and motion.

Задание 4. Сгруппировать антонимы.

Noise, positive, start, silence, far, finish, theory, negative, near, practice, famous, unknown, rest, motion.

Задание 5. Найдите английские эквиваленты.

Положительный электрод, источник электрической энергии, проводник, проводить опыты, батарея, прибор, электрический ток, изолятор.

Задание 6. Выберите правильный вариант.

1. I don't like this motorbike of
a) your b) yours c) you d) Am
2. Willy is wearing a uniform that isn't
a) He b) him c) his d) ours
3. My auto is bigger than hers, but is nicer.
a) Her b) hers c) his d) him
4. We know their names, but they don't know
a) Our b) ours c) us d) his
5. Remember to your headmaster.
a) Mine b) Me c) My d) She
6. This is not my cup; is big.

- a) Mine b) My c) Me d) his
 7. Mary and Jim visitcolleagues very often.
 a) They b) Their c) Theirs d) Mine
 8. We protect ___ from the cold with warm things.
 a) herself b) ourselves c) itself d) yourself
 9. He cut ___ shaving this morning.
 a) himself b) themselves c) myself d) yourself
 10. Please, put the book ... the table.
 In c) on

Задание 7. Прочитайте текст. Ответьте на вопросы, данные к тексту.

A) In electric arc welding it's essential to hold the electrode approximately 4 mm from the surface of the workpiece. You should not leave the electrode too long in the same position because it will become attached to the workpiece. The electrode must be moved across the joint continuously backwards in a straight line. However, if it is moved too quickly neither the electrode nor the workpiece will melt. And it is important to remember that to weld plates by an electric arc is quite dangerous. In order to protect yourself you should always follow certain rules. For example, it is absolutely necessary to wear overalls with long sleeves, gloves, an apron, a cap and rubber boots. A mask or a helmet is used to protect the face and especially eyes from sparks.

1. What is the distance between the electrode and the surface of the workpiece?
2. Why should not you leave the electrode too long in the same position?
3. What is it important to remember in electric arc welding?
4. What is necessary to wear in electric arc welding?
5. Why is a mask or a helmet used?

B) Steel is known as an alloy of iron and about 2% or less carbon. Pure iron is soft, ductile and malleable, useful only as an ornamental material. However, the addition of carbon hardens it greatly and changes its properties. Steels for special applications may contain other alloying elements beside carbon. This modifies and improves the physical properties of the base steel. For example, small percentages of nickel, chromium, manganese and vanadium may be used for strengthening steels for construction work. Heat treatment and mechanical working at cold or hot temperatures may also give steel alloys superior qualities, such as strength, hardness, toughness, wear resistance, corrosion resistance, electrical resistivity and workability.

1. What is steel?
2. How does the addition of carbon modify steel?
3. What may steel for special applications contain?
4. Where is it used?
5. What qualities may heat treatment and mechanical working give steel alloys?

Зачет 5 семестр

**по дисциплине ОГСЭ. 03Иностранный язык в профессиональной деятельности
 специальность: 15.02.15 Технология металлообрабатывающего производства**

I. You will hear 5 people talking about different technological items. For questions 1-5, choose from the list of items A-F what each speaker is describing. There is one extra letter.

- A. a digital camera B. a video camera C. a video recorder D. a mobile phone
 E. a remote control F. an electronic organizer

Speaker 1
Speaker 5

Speaker 2

Speaker 3

Speaker 4

II. Comprehension. Read the text and choose the right variant.

Text 1. TRENDS IN THE MODERN MACHINE-BUILDING INDUSTRY

The scientific and technological progress will continue in engineering along in two main headlines. Firstly, it is automation, including the creation of “unmanned” industries. Secondly, raising the reliability and extending the service life of machines.

This certainly requires new technology. The machine modules on a large scale are well suited for “unmanned” industries.

Intense work is being carried out on new robots. What we need is not merely manipulators which can take up a workpiece and pass it on, but robots which can identify objects, their position in space, etc.

We also need machines that would trace the entire process of machining. Some have been designed and are manufactured. Modern engineering thinking has created new automated coal-digging complexes and machine systems, installations for the continuous casting of steel, machine tools for electrophysical and electrochemical treatment of metals, unique welding equipment, automatic rotor transfer lines and machine-tool modules for flexible industries.

New technologies and equipment have been designed for most branches of engineering.

In the shortest time possible the engineers are to start producing new generations of machines and equipment which would allow manufacturers to increase productivity several times and to find a way for the application of advanced technologies.

Large reserves in expanding service life for machines can be found in the process of designing. At present, advanced methods have been evolved for designing machines proceeding from a number of criteria. Automatic design systems allow for an optimizing of the solutions in design and technology when new machines are still in the blueprint stage.

A promising reserve in increasing the life of parts is strengthening treatment. In recent years new highly efficient methods have been found.

First and foremost of them is the vacuum plasma method for coating components with hard alloy compounds, such as nitrides and carbides of titanium, tungsten and boron. Methods have been designed for reinforcing machine part most vulnerable to wear and tear, such as in grain harvesters, to make them last several times longer.

Thus, it is not merely quantity engineers and scientists are after rather it is a matter of major characteristics. In other words, this is a matter quality, and not of the mere number of new machines, apparatuses and materials.

1.1 Translate the word-combinations:

Срок службы, передовые методы, электрофизическая обработка, модуль станка, система проектирования, составы из твердых сплавов, методы вакуумной плазмы, упрочнение деталей машин, гибкое производство, полностью автоматизированное производство

1.2 Translate the sentences:

1. Much attention is being given at present to the modern equipment of research laboratories.
2. The idea of constructing a new auto plant was widely discussed some years ago.
3. Much is being done to improve the conditions for research work.
4. Wide investigation is being carried on in the field of machine-building.
5. Many old plants and shops are being expanded and reconstructed now.

Exercise 1.3 Answer the questions:

1. Name the main trends in modern machine-building.
2. What does automation include?
3. In what way can automation be achieved?
4. What is the role of new technologies?
5. Give some examples of advanced methods for increasing the service life of machine parts.
6. How can the process of designing be improved?
7. What is the main task of the engineers and scientists developing new machines and technologies?

Text 2. FIVE BASIC TECHNIQUES

The variety and combination of machine tools are unlimited today. Some are small and may be mounted on a workbench. Others are so large that they are housed in special buildings.

Large or small machine tools can be classified in five main groups according to the five basic techniques of shaping metal. These basic operations include drilling and boring (including reaming and tapping), turning, milling, planing (including shaping and broaching) and grinding (including honing). Each machine performs one or more of these operations. Variations of the five basic techniques are used for special situations. There are, for example, machines that combine two of these techniques, as in a boring, drilling and milling machine or a combination of milling and planing machine.

In addition to the five basic techniques there are newer metal shaping methods developed during the past two decades. These new methods employ corrosion, erosion and force characteristics of chemicals, electricity, magnetism, liquids, sound and light.

Drilling and boring. Drilling is a basic machine shop technique. It consists of cutting a round hole by means of a rotating drill. Boring, on the other hand, is the process of finishing a hole already drilled by means of a rotating single-point tool. On some boring machines, the tool is in a fixed position and the work revolves; on others the work is held fixed and the tool revolves.

Under the classification of drilling and boring, there are two types of technique: reaming and tapping. Reaming consists of finishing a hole already drilled. Tapping is the process of cutting a thread in a hole.

2.1. Прочитайте текст и найдите в нем ответы на следующие вопросы:

1. How many groups can machine tools be classified?
2. What basic operations of shaping metal do machine tools include?
 1. What new metal shaping methods were developed during the past two decades?
 2. What do these new methods employ?
3. What is drilling?
4. What is boring?
5. What differs drilling machines from boring machines?
6. What is the difference between reaming and tapping?

2.2 Translate the sentences:

1. Forging is one of the leading technological processes of modern industry.
2. These machines were built up by the workers of our plant for three hours.
3. All these forged parts were made of different materials.
4. The students of the machine-building industry were shown various manufacturing processes.
5. This part was made of steel by casting
6. The main parts of these machines were produced by forging.
7. The machine-building plant of our town produces these machine-tools (металлорежущие станки).
8. The loss of metal in chips in forging process is reduced.
9. The selecting of the most suitable method of forging entails the minimum consumption of metal.
10. The art of drawing metal has developed very rapidly in the last 20 years.

Text 3: METALS

Metals are materials most widely used in industry because of their properties. The study of the production and properties of metals is known as metallurgy.

The separation between the atoms in metals is small, so most metals are dense. The atoms are arranged regularly and can slide over each other. That is why metals are malleable (can be deformed and bent without fracture) and ductile (can be drawn into wire). Metals vary greatly in their properties. For example, lead is soft and can be bent by hand, while iron can only be worked by hammering at red heat.

The regular arrangement of atoms in metals gives them a crystalline structure. Irregular crystals are called grains. The properties of the metals depend on the size, shape, orientation, and composition of these grains. In general, a metal with small grains will be harder and stronger than one with coarse grains.

Heat treatment such as quenching, tempering, or annealing controls the nature of the grains and their size in the metal. Small amounts of other metals (less than 1 per cent) are often added to a pure metal. This is called alloying (легирование) and it changes the grain structure and properties of metals.

All metals can be formed by drawing, rolling, hammering and extrusion, but some require hot-working. Metals are subject to metal fatigue and to creep (the slow increase in length under stress) causing deformation and failure. Both effects are taken into account by engineers when designing, for example, airplanes, gas-turbines, and pressure vessels for high-temperature chemical processes. Metals can be worked using machine-tools such as lathe, milling machine, shaper and grinder.

The ways of working a metal depend on its properties. Many metals can be melted and cast in moulds, but special conditions are required for metals that react with air.

3.1 Answer the questions:

1. What are metals and what do we call metallurgy?
2. Why are most metals dense?
3. Why are metals malleable?
4. What is malleability?
5. What are grains?
6. What is alloying?
7. What is crystalline structure?
8. What do the properties of metals depend on?
9. What changes the size of grains in metals?
10. What are the main processes of metal forming?
11. How are metals worked?
12. What is creeping?

3.2 Translate into English:

1. Металлы — плотные материалы потому, что между атомами в металлах малое расстояние.
2. Металлы имеют кристаллическую структуру из-за правильного расположения атомов.
3. Чем меньше зерна, тем тверже металл.
4. Закалка и отжиг изменяют форму и размер зерен в металлах.
5. Легирование изменяет структуру зерен и свойства металлов.
6. Металл деформируется и разрушается из-за усталости и ползучести.

Контрольный перевод.

Переведите отрывки без словаря (письменно).

Вариант 1

Maximum practical arc speed for the definite welding conditions is the main factors since this is necessary to fully use the penetrating action of the arc force.

Since increased arc speed results in increase of the metal deposited there is great economy in money, time, metal and current.

When the arc is moved slowly there is a small pool of molten metal under the arc and the force of the arc is lost in the molten pool instead of penetrating into the parent metal in the groove of the joint.

The molten metal does not fuse below the depth to which the arc penetrates. As we see, in slow arc speed there usually is a small

Pool of molten metal under the arc not providing deep penetration.

Of course, penetration not only depends upon the arc speed but also upon the current provided the arc speed matches the current increase.

Вариант 2

From these facts, it is evident that to get greater penetration the arc should be moved more rapidly rather slowly.

An increase in current increases the arc force and provides deep penetration.

The quality of the weld also depends upon the arc length and the position of the electrode.

When the arc length is too long, heat is lost in the air, much molten metal is also lost in the form of spatter and the force is soared over a large area to give a winder molten pool.

Too short arc, as you know, may result in poor penetration or even short-circuiting.

In conclusion it has been show, that to obtain the highest welding speeds it is necessary to penetrate deeply into the base metal resulting in fusion of parent metal with the weld metal.

The amount of penetration and the economy are proportional to the current used, combining with the effectiveness of the use of arc force.

Вариант 3

Welding can be dangerous. Any of these accidents might happen to you: you could be blinded by sparks; you could get an electric shock, your face, body, arms, legs or feet could be burnt; there could be a fire in the workshop. That's why it's absolutely necessary to wear protective clothing. A mask or helmet must be worn in electric arc welding. In gas welding goggles can be used. Clothes must be kept dry and clean. Thick, heavy boots must be worn. They must be made of some insulating material such as rubber. Gloves, apron and a cap must be worn. Overalls must have long sleeves and no pockets or cuffs. The floor in the workshop is made of concrete. There must be a metal container on the floor for the sparks.

Зачет 6 семестр
по дисциплине ОГСЭ. 03Иностранный язык в профессиональной деятельности
специальность: 15.02.15 Технология металлообрабатывающего производства

I. Test:

1. Choose the right variant.

1 Will Mr. Cranby... the money to the shop-owner?							
A	to bring	B	carry	C	take	D	bring
2 Where did he... the car?							
A	buys	B	bought	C	buy	D	has bought
3 He has left his purse...							
A	anywhere	B	somewhere	C	everywhere	D	nowhere
4 Mr. Cranby's house was on...							
A	a hill top	B	the hill's top	C	the top of the hill	D	hills top
5 When someone talks to ... people may think he is mad.							
A	oneself	B	itself	C	yourself	D	himself
6 She is arriving tomorrow, ...?							
A	isn't she	B	doesn't she	C	won't she	D	is she
7 Tell me ... you think about him.							
A	that	B	that what	C	what	D	which

8 Russian people speak... than Italian people.							
A	more slowly	B	slower	C	more slow	D	slowlier
9 ... is dangerous to your health.							
A	Smoke	B	To smoke	C	Smoking	D	A smoke
10 He had nothing...							
A	to sit	B	for sitting	C	to be seated	D	to sit on
11 Let's go for a drive ... any more.							
A	as it isn't raining	B	as it doesn't raining	C	though it doesn't rain	D	for it isn't raining
12 At the party he had ... drinks.							
A	any	B	nothing	C	so much	D	too many
13 ... people cannot drive at all.							
A	few	B	a few	C	none	D	some
14 ... driving before buying a car.							
A	There is necessary to learn	B	That is necessary learning	C	It is necessary	D	To is necessary learning
15 ... your coat and hat as it's cold.							
A	Put on	B	Take off	C	Pick up	D	Put up
16 ... in their family likes each other.							
A	All they	B	Both of them	C	Everyone	D	All persons
17 He has visited Canada two times ...							
A	last month	B	this year	C	A year ago	D	in summer
18 When ... study English?							
A	have you begun to	B	you begin to	C	did you begin to	D	did you begun
19 He likes driving and ...							
A	so is she	B	so she likes	C	so does she	D	so likes she
20 This is the film I ...							
A	like it more	B	am liking most	C	most like	D	like most

2. Choose the extra word.

22	A	Take	B
23	A	Green	B
24	A	Talk	B
25	A	When	B
26	A	Merry	B
27	A	Quickly	B
28	A	Brought	B
29	A	Table	B
30	A	Make	B

II. Практические задания

Задание 1. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

Scientists consider that the oldest tools that are known to the mankind are 2600000 years old. They were used by people in manual operations and that is why they were called hand tools. By the beginning of the Industrial Revolution, people had already made simple hand tools for cutting and shaping different materials. But in the 18th century there appeared machine tools that made mass production a reality in the 19th century. A machine tool is a power-driven machine that is used to perform different operations with metal or other material. Basic machine tools use mechanical power to bend, cut, and drill metal into desired shapes. More advanced machine tools use such power sources as electrical or chemical, heat, magnetism and ultrasound.

1. How old are the oldest tools?
2. Where were they used by people?
3. Why were they called so?
4. When did the first machine tools appear?
5. What is a machine tool?

Задание 2. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

Welding can be dangerous. Any of these accidents might happen to you: you could be blinded by sparks; you could get an electric shock, your face, body, arms, legs or feet could be burnt; there could be a fire in the workshop. That's why it's absolutely necessary to wear protective clothing. A mask or helmet must be worn in electric arc welding. In gas welding goggles can be used. Clothes must be kept dry and clean. Thick, heavy boots must be worn. They must be made of some insulating material such as rubber. Gloves, apron and a cap must be worn. Overalls must have long sleeves and no pockets or cuffs. The floor in the workshop is made of concrete. There must be a metal container on the floor for the sparks.

1. Why is welding dangerous?
2. What is necessary to do to protect yourself?
3. Why must you keep clothes dry?
4. What material must boots be made of?

5. Why do you need a metal container on the floor?

Задание 3. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

Nowadays machine tools play an important role in the manufacture of almost all metal products. Machinists use them in making automobiles, radios, refrigerators, television sets and so on. Every mechanical workshop is equipped with machine tools. They are the main source for the manufacture of component parts of all machines and mechanical devices. There are about 500 kinds of machine tools. Some perform a single operation, such as drilling. Others, called machining centers, carry out several kinds of tasks.

1. Why are machine tools very important nowadays?
2. Where are they used?
3. How many kinds of machine tools are there?
4. What operations do they perform?
5. Why are machining centers called so?

Задание 4. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

Every mechanical workshop is equipped with machine tools. They are the main source for the manufacture of component parts of all machines and mechanical devices. There are about 500 kinds of machine tools. Some perform a single operation, such as drilling. Others, called machining centers, carry out several kinds of tasks. These numerous machine tool types fall into two categories. The first group is called "metal-cutting", the second – "metal-forming". The machine tools of this group remove some material from the workpiece and they are much stronger than the workpiece itself. The examples of metal-cutting machines are lathes and drill presses.

1. What is mechanical shop equipped with?
2. How many kinds of machine tools are there?
3. What operations do they perform?
4. Why are machining centers called so?
5. What machine tools can be called metal-cutting?

Задание 5. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

Steel is known as an alloy of iron and about 2% or less carbon. Pure iron is soft, ductile and malleable, useful only as an ornamental material. However, the addition of carbon hardens it greatly and changes its properties. Steels for special applications may contain other alloying elements beside carbon. This modifies and improves the physical properties of the base steel. For example, small percentages of nickel, chromium, manganese and vanadium may be used for strengthening steels for construction work. Heat treatment and mechanical working at cold or hot temperatures may also give steel alloys superior qualities, such as strength, hardness, toughness, wear resistance, corrosion resistance, electrical resistivity and workability.

1. What is steel?
2. How does the addition of carbon modify steel?
3. What may steel for special applications contain?
4. Where is it used?
5. What qualities may heat treatment and mechanical working give steel alloys?

Задание 6. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

The value of alloys was discovered in very ancient times. Brass and bronze were especially important. Today the most important are alloy steels, which have a lot of special characteristics. Steel is known as an alloy of iron and about 2% or less carbon. Steel making processes are known as melting, purifying and alloying at about 2900 F. Molten steel may be first cast into ingots. Later ingots are worked into finished products. This may be done by two major methods: hot-working and cold-working. The latter is generally used for making bars, wires, tubes, sheets and strips. Molten steel may also be cast directly into products.

1. What alloys were especially important in very ancient times?
2. What alloy is the most important today?
3. What is steel?
4. What are steel making processes?
5. What is molten steel used for?

Задание 7. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

The workability and the ability for corrosion resistance made copper, bronze and brass the most important functional as well as decorative materials from the Middle Ages and on till present days. With the beginning of the Electrical Age the demand for copper increased tremendously because it is an unusually good conductor of electricity and heat. Today more than 5 million tons of copper are produced annually and the copper metals are playing an increasingly vital part in all branches of modern technology.

1. What made copper, bronze and brass the most important functional and decorative materials?
2. When did the demand for copper increase?
3. Why did it increase?
4. How much copper is produced annually?
5. Are the copper metals are playing an increasingly vital part in modern technology?

Задание 8. Прочитайте текст профессиональной направленности и переведите его на русский язык. Ответьте на вопросы, данные к тексту.

Steels vary greatly but the major classes are carbon steels, low-alloy steels and high-alloy steels. Tool steels are special steels that are engineered to particular service requirements. These expensive alloys are exceptionally strong, hard, wear-resistant, tough, and nonreactive to local overheating. They contain tungsten, molybdenum, vanadium and chromium in different combinations, and often cobalt or nickel for better high-temperature performance. They are used for machine tools, aircraft undercarriages, in buildings and bridges.

1. What are the major classes of steel?
2. What is tool steel?
3. What characteristics do tool steels have?
4. What do they contain?
5. Where are they used?

**Дифференцированный зачет 7 семестр
по дисциплине ОГСЭ. 03 Иностранный язык в профессиональной
деятельности специальность: 15.02.15 Технология металлообрабатывающего
производства**

1. Listen an extract from a lecture about matrix. Which statement are true?

1. A matrix is a table of abstract quantities that can be added or multiplied.
2. No form of matrix was used in prehistoric times.
3. Matrix can be added, multiplied and decomposed in different ways.
4. The horizontal lines in a matrix are the columns.
5. A matrix with **m** rows and **n** columns is known as an **m-by-n** matrix.

2. Прочитайте текст профессиональной направленности (по вариантам) и переведите его на русский язык. Задайте не менее 10 вопросов к тексту.

Text 1 «Metals»

Metals are materials most widely used in industry because of their properties. The study of the production and properties of metals is known as metallurgy.

The separation between the atoms in metals is small, so most metals are dense. The atoms are arranged regularly and can slide over each other. The atoms are arranged regularly and can slide over each other. That is why metals are malleable (can be deformed and bent without fracture) and ductile (can be drawn into wire). Metals vary greatly in their properties. For example, lead is soft and can be bent by hand, while iron can only be worked by hammering at red heat.

The regular arrangement of atoms in metals gives them crystalline structure. Irregular crystals are called grains. The properties of the metals depend on the size, shape, orientation, and composition of these grains. In general, a metal with small grains will be harder and stronger than one with coarse grains.

Heat treatment such as quenching, tempering, or annealing controls the nature of the grains and their size in the metal. Small amounts of other metals (less than 1 per cent) are often added to a pure metal. This is called alloying (легирование) and it changes the grain structure and properties of metals.

All metals can be formed by drawing, rolling, hammering and extrusion, but some require hot-working. Metals are subject to metal fatigue and to creep (the slow increase in length under stress) causing deformation and failure. Both effects are taken into account by engineers when designing, for example, airplanes, gas-turbines, and pressure vessels for high-temperature chemical processes. Metals can be worked using machine-tools such as lathe, milling machine, shaper and grinder.

The ways of working a metal depend on its properties. Many metals can be melted and cast in moulds, but special conditions are required for metals that react with air.

Text 2 «Steel»

The most important metal in industry is iron and its alloy- steel. Steel is an alloy of iron and carbon. It is strong and stiff, but corrodes easily through rusting, although stainless and other special steels resist corrosion. The amount of carbon in a steel influences its properties considerably. Steels of low carbon content (mild steels) are quite ductile and are used in the

manufacture of sheet iron, wire, and pipes. Medium-carbon steels containing from 0.2 to 0.4 per cent carbon are tougher and stronger and are used as structural steels. Both mild and medium-carbon steels are suitable for forging and welding. High-carbon steels contain from 0.4 to 1.5 per cent carbon, are hard and brittle and are used in cutting tools, surgical instruments, razor blades and springs. Tool steel, also called silver steel, contains about 1 per cent carbon and is strengthened and toughened by quenching and tempering.

The inclusion of other elements affects the properties of the steel. Manganese gives extra strength and toughness. Steel containing 4 per cent silicon is used for transformer cores or electromagnets because it has large grains acting like small magnets. The addition of chromium gives extra strength and corrosion resistance, so we can get rust-proof steels. Heating in the presence of carbon or nitrogen-rich materials is used to form a hard surface on steel (case-hardening). High-speed steels, which are extremely important in machine-tools, contain chromium and tungsten plus smaller amounts of vanadium, molybdenum and other metals. Quenching is a heat treatment when metal at a high temperature is rapidly cooled by immersion in water or oil. Quenching makes steel harder and more brittle, with small grains structure. Tempering is a heat treatment applied to steel and certain alloys. Hardened steel after quenching from a high temperature is too hard and brittle. Tempering, that is re-heating to an intermediate temperature and cooling slowly, reduces this hardness and brittleness. Tempering temperatures depend on the composition of the steel but are frequently between 100 and 650°C. Higher temperatures usually give a softer, tougher product. The colour of the oxide film produced on the surface of the heated metal often serves as the indicator of its temperature.

Annealing is a heat treatment in which a material at high temperature is cooled slowly. After cooling the metal again becomes malleable and ductile (capable of being bent many times without cracking)

All these methods of steel heat treatment are used to obtain steels with certain mechanical properties for certain needs.

Text 3 «Methods of steel heat treatment»

Quenching is a heat treatment when metal at a high temperature is rapidly cooled by immersion in water or oil. Quenching makes steel harder and more brittle, with small grains structure. Tempering is a heat treatment applied to steel and certain alloys. Hardened steel after quenching from a high temperature is too hard and brittle for many applications and is also brittle. Tempering, that is re-heating to an intermediate temperature and cooling slowly, reduces this hardness and brittleness. Tempering temperatures depend on the composition of the steel but are frequently between 100 and 650°C. Higher temperatures usually give a softer, tougher product. The colour of the oxide film produced on the surface of the heated metal often serves as the indicator of its temperature.

Annealing is a heat treatment in which a material at high temperature is cooled slowly. After cooling the metal again becomes malleable and ductile (capable of being bent many times without cracking)

All these methods of steel heat treatment are used to obtain steels with certain mechanical properties for certain needs.

Text 4 «Metalworking processes»

Metals are important in industry because they can be easily deformed into useful shapes. A lot of metalworking processes have been developed for certain applications. They can be divided into five broad groups:

1. rolling
2. extrusion
3. drawing

4. forging

5. sheet-metal forming.

During the first four processes metal is subjected to large amounts of strain (deformation). But if deformation goes at a high temperature, the metal will recrystallize- that is, new strain-free grains will grow instead of deformed grains. For this reason metals are usually rolled, extruded, drawn, or forged above their recrystallization temperature. This is called hot working. Under these conditions there is no limit to the compressive plastic strain to which the metal can be subjected. Other processes are performed below the recrystallization temperature. These are called cold working. Cold working hardens metal and makes the part stronger. However, there is a limit to the strain before a cold part cracks.

Rolling

Rolling is the most common metalworking process. More than 90 percent of the aluminum, steel and copper produced is rolled at least once in the course of production. The most common rolled product is sheet. Rolling can be done either hot or cold. If the rolling is finished cold, the surface will be smoother and the product stronger.

Extrusion

Extrusion is pushing the billet to flow through the orifice of a die. Products may have either a simple or a complex cross section. Aluminium window frames are the examples of complex extrusions. Tubes or other hollow parts can also be extruded. The initial piece is a thick-walled tube, and the extruded part is shaped between a die on the outside of the tube and a mandrel held on the inside. In impact extrusion (also called back-extrusion) (Штамповка выдавливанием), the workpiece is placed in the bottom of a hole and a loosely fitting ram is pushed against it. The ram forces the metal to flow back around it, with the gap between the ram and the die determining the wall thickness. The example of this process is the manufacturing of aluminum beer cans.

Text 5 «Metalworking and metal properties»

An important feature of hot working is that it provides the improvement of mechanical properties of metals. Hot-working (hot-rolling or hot-forging) eliminates porosity, directionality, and segregation that are usually present in metals. Hot-worked products have better ductility and toughness than the unworked casting. During the forging of a bar, the grains of the metal become greatly elongated in the direction of flow. As a result, the toughness of the metal is greatly improved in this direction and weakened in directions transverse to the flow. Good forging makes the flow lines in the finished part oriented so as to lie in the direction of maximum stress when the part is placed in service.

The ability of a metal to resist thinning and fracture during cold-working operations plays an important role in alloy selection. In operations that involve stretching, the best alloys are those which grow stronger with strain (are strain hardening) – for example, the copper-zinc alloy, brass, used for cartridges and the aluminum-magnesium alloys in beverage cans, which exhibit greater strain hardening.

Fracture of the workpiece during forming can result from inner flaws in the metal. These flaws often consist of nonmetallic inclusions such as oxides or sulfides that are trapped in the metal during refining. Such inclusions can be avoided by proper manufacturing procedures.

The ability of different metals to undergo strain varies. The change of the shape after one forming operation is often limited by the tensile ductility of the metal. Metals such as copper and aluminum are more ductile in such operations than other metals.

Text 6 «Welding»

Welding is a process when metal parts are joined together by the application of heat, pressure, or a combination of both. The processes of welding can be divided into two main groups:

- pressure welding, when the weld is achieved by pressure and
- heat welding, when the weld is achieved by heat. Heat welding is the most common welding process used today.

Nowadays welding is used instead of bolting and riveting in the construction of many types of structures, including bridges, buildings, and ships. It is also a basic process in the manufacture of machinery and in the motor and aircraft industries. It is necessary almost in all productions where metals are used.

The welding process depends greatly on the properties of the metals, the purpose of their application and the available equipment. Welding processes are classified according to the sources of heat and pressure used: gas welding, arc welding, and resistance welding. Other joining processes are laser welding, and electron-beam welding.

Gas Welding. Gas welding is a non-pressure process using heat from a gas flame. The flame is applied directly to the metal edges to be joined and simultaneously to a filler metal in the form of wire or rod, called the welding rod, which is melted to the joint. Gas welding has the advantage of using equipment that is portable and does not require an electric power source. The surfaces to be welded and the welding rod are coated with flux, a fusible material that shields the material from air, which would result in a defective weld.

Arc Welding. Arc-welding is the most important welding process for joining steels. It requires a continuous supply of either direct or alternating electrical current. This current is used to create an electric arc, which generates enough heat to melt metal and create a weld. Arc welding has several advantages over other welding methods. Arc welding is faster because the concentration of heat is high. Also, fluxes are not necessary in certain methods of arc welding. The most widely used arc-welding processes are shielded metal arc, gas-tungsten arc, gas-metal arc, and submerged arc.

**Дифференцированный зачет 8 семестр
по дисциплине ОГСЭ. 03 Иностранный язык в профессиональной деятельности
специальность: 15.02.15 Технология металлообрабатывающего производства**

1. You will hear a talk about a famous mathematician. Correct the statements which are wrong.

1. Norbert Wiener enjoyed fine arts.
2. Norbert Wiener was only ever taught at home.
3. Norbert Wiener got his undergraduate degree at the age of 18.
4. Norbert Wiener's working life was 50 years long.
5. Only a few cyber terms have been coined.

VARIANT I. Machine Tools

1. Define the right English equivalent:

создавать a) to shape b) to fabricate c) to grind d) to broach
обрабатывать a) to drill b) to hone c) to machine d) to fabricate
формировать a) to shape b) to screw c) to grind d) to broach
отпечатывать a) to mill b) to stamp c) to machine d) to drill
фрезеровать a) to drill b) to hone c) to machine d) to mill
сверлить a) to mill b) to screw c) to machine d) to drill
шлифовать a) to shape b) to fabricate c) to grind d) to broach
хонинговать a) to drill b) to hone c) to machine d) to mill
прошивать отверстие a) to shape b) to fabricate c) to grind d) to broach
нарезать резьбу a) to screw b) to fabricate c) to grind d) to broach

2. Find the Participle I or II, define its function, translate the sentences into Russian:

A machine tool is a powered mechanical device, typically used to fabricate metal components of machines by machining which is the selective removal of metal. Many historians of technology consider that the true machine tools were born when direct human involvement was removed from the shaping or stamping process of the different kinds of tools.

The earliest lathe with direct mechanical control of the cutting tool was a screw-cutting lathe dating to about 1483.

Human and animal power are options, as is energy captured through the use of waterwheels.

Early machines used flywheels to stabilize their motion and had complex systems of gears and levers to control the machine and the piece being worked on.

Such machines became known as computerized numerical control (CNC) machines.

Before long, the machines could automatically change the specific cutting and shaping tools that were being used.

When fabricating or shaping parts, several techniques are used to remove unwanted metal.

Text: Machine Tools

A machine tool is a powered mechanical device, typically used to fabricate metal components of machines by machining which is the selective removal of metal. The term machine tool is usually reserved for tools that used a power source other than human movement, but they can be powered by people if appropriately set up. Many historians of technology consider that the true machine tools were born when direct human involvement was removed from the shaping or stamping process of the different kinds of tools. The earliest lathe with direct mechanical control of the cutting tool was a screw-cutting lathe dating to about 1483. This lathe "produced screw threads out of wood and employed a true compound slide rest".

Machine tools can be powered from a variety of sources. Human and animal power are options, as is energy captured through the use of waterwheels. However, machine tools really began to develop after the development of the steam engine, leading to the Industrial Revolution. Today, most are powered by electricity.

Machine tools can be operated manually, or under automatic control. Early machines used flywheels to stabilize their motion and had complex systems of gears and levers to control the machine and the piece being worked on. Soon after World War II, the numerical control (NC)

machine was developed. NC machines used a series of numbers punched on paper tape or punch cards to control their motion. In the 1960s, computers were added to give even more flexibility to the process. Such machines became known as computerized numerical control (CNC) machines. NC and CNC machines could precisely repeat sequences over and over, and could produce much more complex pieces than even the most skilled tool operators.

Before long, the machines could automatically change the specific cutting and shaping tools that were being used. For example, a drill machine might contain a magazine with a variety of drill bits for producing holes of various sizes. Previously, either machine operators would usually have to manually change the bit or move the work piece to another station to perform these different operations. The next logical step was to combine several different machine tools together, all under computer control. These are known as machining centers, and have dramatically changed the way parts are made.

From the simplest to the most complex, most machine tools are capable of at least partial self-replication since they are machines, and produce machine parts as their primary function.

Examples of machine tools are:

- | | |
|----------------------|----------------------------|
| 1. Broaching machine | 8. Milling machine |
| 2. Drill press | 9. Shaper |
| 3. Gear shaper | 10. Saws |
| 4. Hobbing machine | 11. Planer |
| 5. Hone | 12. Stewart platform mills |
| 6. Lathe | 13. Grinders |
| 7. Screw machines | |

When fabricating or shaping parts, several techniques are used to remove unwanted metal. Among these are:

- EDM (electrical discharge machining)
- Grinding
- Multiple edge cutting tools (cutting tool (metalworking))
- Single edge cutting tools (cutting tool (metalworking))

Other techniques are used to add desired material. Devices that fabricate components by selective addition of material are called rapid prototyping machines.

3. Complete the sentences:

1. The term machine tool is usually reserved for tools that used
2. The earliest lathe with direct mechanical control of the cutting tool was
3. Machine tools can be powered from

4. Machine tools can be operated
5. NC and CNC machines could precisely repeat sequences ..., and could produce much more
6. A drill machine might contain
7. Machine tools under computer control are known as

4. Make up the plan of the text "Machine Tools".

Variant II Lathe

1. Read the following words and word combinations, give the Russian equivalents

bed; headstock; tail-stock; carriage; thread cutting mechanism; feeding mechanism; casting; support; align; slide; locate; carry; bearing; obtain; shaft; hollow; bore; taper; insert; thread; nose; move; graduate; measure; contain; either.....or; both.....and; apron; engage; saddle; ways.

Text: Lathe

Read and the text, write out the sentences with the Infinitive, translate them.

Brief Introduction

A lathe (pronounced /'leɪð/) is a machine tool which spins a block of material to perform various operations such as cutting, sanding, knurling, drilling, or deformation with tools that are applied to the workpiece to create an object which has symmetry about an axis of rotation.

Lathes are used in woodturning, metalworking, metal spinning, and glass-working. Lathes can be used to shape pottery, the best-known design being the potter's wheel. Most suitably equipped metalworking lathes can also be used to produce most solids of revolution, plane surfaces and screw threads or helices. Ornamental lathes can produce three-dimensional solids of incredible complexity. The material is held in place by either one or two centers, at least one of which can be moved horizontally to accommodate varying material lengths. Examples of objects that can be produced on a lathe include candlestick holders, cue sticks, table legs, bowls, baseball bats, musical instruments (especially woodwind instruments), crankshafts and camshafts.

Lathe

Lathe is still the most important machine-tool. It produces parts of circular cross-section by turning the workpiece on its axis and cutting its surface with a sharp stationary tool. The tool may be moved sideways to produce a cylindrical part and moved towards the workpiece to control the depth of cut. Nowadays all lathes are power-driven by electric motors. That allows continuous rotation of the workpiece at a variety of speeds. The modern lathe is driven by means of a headstock supporting a hollow spindle on accurate bearings and carrying either a chuck or a faceplate, to which the workpiece is clamped. The movement of the tool, both along the lathe bed and at right angle to it, can be accurately controlled, so enabling a part to be machined to close tolerances. Modern lathes are often under numerical control.

2. Find English equivalents in the text:

- | | |
|---|--|
| 1. обрабатываемый материал | 9. сверление ультразвуком |
| 2. электропривод | 10. резание с помощью лазерного луча |
| 3. более точный | 11. гибкие производственные системы |
| 4. отдельные детали | 12. детали круглого сечения |
| 5. процесс массового производства | 13. поворачивать деталь вокруг ее оси |
| 6. приспособления для держания резца и детали | 14. двигать в сторону, двигать по направлению к детали |
| 7. операции по механической обработке детали | 15. глубина резания |
| 8. 8) высоковольтный разряд | 16. непрерывное вращение детали |

3. Translate into English:

1. Токарный станок позволяет производить детали круглого сечения.
2. Деталь зажимается в патроне или на планшайбе токарного станка.
3. Резец может двигаться как вдоль станины, так и под прямым углом к ней.
4. Современные токарные станки часто имеют цифровое управление.

4. Answer the questions:

1. What are machine-tools used for?
2. How are most machine-tools driven nowadays?
3. What facilities have all machine-tools?
4. How are the cutting tool and the workpiece cooled during machining?
5. What other machining methods have been developed lately?
6. What systems are used now for the manufacture of a range of products without the use of manual labour?
7. What parts can be made with lathes?
8. How can the cutting tool be moved on a lathe?
9. How is the workpiece clamped in a lathe?
10. Can we change the speeds of workpiece rotation in a lathe?
11. What is numerical control of machine tools used for?

Контрольная работа за 9 семестр
по дисциплине ОГСЭ.03 Иностранный язык в профессиональной деятельности
специальность: 15.02.15Технологияметаллообрабатывающегопроизводства

1. Listen to the radio programme and choose the correct answer.

1. Alexander Graham Bell was born in...
A. the USA B. Scotland C. Canada
2. Which of Bell's relatives were deaf?
A. his mother and his wife B. his father and mother C. his grandmother and mother
3. What was the problem with the telegraph?

A. It was too slow. B. It sometimes lost the message. C. The message got confused.

4. The first phone call was made on...

A. March 17th 1867 B. March 9th 1906 C. March 10th 1876

5. Bell's assistant was called...

A. Wilson B. Watson C. Winston

6. How did Bell feel about his invention?

A. amazed B. pleased C. nervous

Вариант 1

1. Translate the original and derivative words, using a dictionary and create several new words by adding suffixes:

verb	noun (abstract)	noun (personal)	adjective
to transform	transformation transformer	-	-
<i>ограничивать</i>	limit limitation	-	limitary ограничивающий limited limitless
to add	addition additive	-	additional
<i>формировать</i>	form formation former	former	formative <i>бывший, прежний</i>
to desire	<i>желание</i> desirability	-	desirous desirable

2. Translate the sentences, paying attention to compound conjunctions:

1. In ancient states the use of iron, either cast or wrought, was rather limited.
2. It is known that both ferrous and non-ferrous metals are widely used.
3. The carbon content may be either less or higher than 2,14 %.
4. Graphite flakes in gray cast iron are surrounded by either ferrite or pearlite.
5. Both ferrous and non-ferrous metals possess many characteristic features.
6. *Some alloying elements can form either compounds or carbides.*

Text Metals and Alloys

Each metal possesses certain distinct combinations of properties, that may be varied for specific engineering applications by alloying it with relatively, small amounts of other materials. The term "alloy" is used to determine a material containing more than one chemical element. The properties of the alloy being determined by the properties of the elements it consists of. The main alloying element in ferrous metals is carbon (C). Depending on the amount of carbon, alloys have different properties. The carbon content may be either less or higher than 2,14 %. Below this amount of carbon material undergoes hard cast eutectoid* transformation, while above that limit ferrous materials undergo easy cast eutectic** transformation. The ferrous alloys with less than 2,14 % C are termed as steels, and the ferrous alloys with higher than 2,14 % C are termed as cast irons.

Steels are alloys of iron and carbon with other alloying elements. Steels can be low, medium and high carbon. Cast irons may contain 3.0–4.5 % C along with some other alloying additions and melt at lower temperatures than steels. Cast irons are specified as gray, white, nodular and malleable cast irons.

Gray cast iron consists of carbon in the form of graphite flakes, which are surrounded by either ferrite or pearlite. Although gray cast irons are weak and brittle they possess good damping properties and are applied in base structures, beds for heavy machines as they have high resistance to wear.

White cast irons are very brittle. Hence their use is limited to wear resistant applications, such as rollers in rolling mills. Usually white cast iron is heat treated to produce malleable iron.

Malleable cast irons are stronger and possess high amount of ductility. Their typical application include railroad, connecting rods, marine and other heavy-duty services.

Nodular (or ductile) cast irons are stronger and more ductile than gray cast irons. Their applications are pump bodies, crank shafts, automotive components, etc.

Non-ferrous alloys are also widely used in engineering.

Aluminium alloys are characterized by low density, high thermal and electrical conductivities, good corrosion resistant characteristics. But the great limitation of these alloys is their low melting point (660 °C). Aluminum alloys with Lithium (Li), Magnesium (Mg) and Titanium (Ti) are paid much attention when vehicle weight reduction is concerned. They are very useful in aircraft and aerospace industries. Common applications of Al alloys include: beverage cans, automotive parts, bus bodies. It is worth mentioning that aluminum alloys are used where light weight is needed. They are also used because of their resistance to corrosion. Aluminum alloys also possess desirable property of thermal and electrical conductivity.

Beside aluminum alloys there are some other non-ferrous ones: copper, lead, tin, zinc, nickel alloys. It is necessary to point out that both ferrous and non-ferrous metals possess many characteristic features: elasticity, ductility, malleability, toughness, brittleness, hardness, wear resistance and corrosion resistance. Copper alloys form such metals, as brass and bronze. The aluminum alloys with copper, manganese, silicon and nickel are widely used where corrosion resistance, high electrical conductivity, ductility and high strength are needed. Zinc alloys have some advantages over others in foundry: excellent casting properties, machinable and lower density than bronze.

In machinery there is one of the most interesting metals, called titanium. Titanium has wonderful property – it is completely inert in biological media and that is why is being widely used in medical purposes for making artificial joints and surgery instruments. Owing to its high corrosion resistance, lightness, tensile strength and ease of forging, rolling and stamping titanium is used in a great variety of fields. Titanium alloys are applied in mechanical engineering, medical and chemical areas.

Alloying elements are added to achieve certain properties in the material. Alloying elements are added in lower percentages (less than 5 %) to increase strength or hardenability, or in larger percentages (over 5 %) to achieve special properties, such as corrosion resistance or extreme temperature stability.

Manganese, silicon, or aluminum are added during the steel-making process to remove dissolved oxygen from the melt. Manganese, silicon, nickel, and copper are added to increase strength by forming solid solutions in ferrite. Chromium, vanadium, molybdenum, and tungsten increase strength by forming second-phase carbides. Nickel and copper improve corrosion resistance in small quantities. Molybdenum helps to resist embrittlement. Zirconium, cerium, and calcium increase toughness by controlling the shape of inclusions. Manganese sulfide, lead, bismuth, selenium, and tellurium increase machinability. All mentioned alloying elements can form either compounds or carbides.

* eutectoid – эвтектоид (сплав, точка плавления которого выше точек плавления входящих в его состав компонентов).

** eutectic – эвтектический (сплав, точка плавления которого ниже).

3. Complete the sentences:

1. The term “alloy” determines...
2. The main alloying element in ferrous metals is ...
3. The ferrous alloys with less than 2,14 % C are termed as...
4. Ferrous and non-ferrous alloys are widely used in ...
5. Aluminum alloys are mainly used because of ...
6. Aluminum alloys possess desirable property of ...
7. Zinc alloys have advantages over...
8. Titanium alloys are applied in ...
9. Alloying elements are added to some metals in order to...
10. All alloying elements can form ...

4. Insert the proper words into the sentences:

1. The term (сплав) determines material (содержащий) more than one element.
2. (Углерод) is the main (легирующий) element in (черный) metals.
3. Each metal (обладать) distinct (свойствами).
4. Steels are alloys of (железо) and (углерод) with other (легирующими) elements.
5. Gray (чугун) is weak and (хрупкий).
6. (Ковкийчугун) possesses high amount of (тягучесть).
7. (Недостатком) of aluminum alloys is their low (температураплавления).
8. Aluminum alloys are used where (требуется легкий вес).
9. (Медные сплавы) form such metals, as (латунь) and (бронза).
10. Titanium is inert in (биологической среде) and is widely used in (медицина).

5. Find in the text the sentences that correspond to the following statements:

1. The amount of carbon in metals may differ.
2. Different amount of carbon form quite different alloys.
3. Each metal has its own properties depending on the alloying elements.
4. Different amount of carbon affects the types of steels.
5. Cast irons can be divided into several groups.
6. Aluminum alloys show various useful features.
7. In engineering there is a great variety of non-ferrous alloys.
8. The aluminum alloys can have some other alloying elements and are useful in particular technical conditions.
9. Titanium is used in different fields due to its numerous remarkable properties.
10. Alloying elements in certain proportions improve the properties of metals.

6. Translate into English:

1. Термин «сплав» означает материал, состоящий более чем из одного элемента.
2. Основным легирующим элементом черных металлов является углерод.
3. В зависимости от процентного содержания углерода сплавы делятся на стали и чугуны.
4. Существуют не только черные, но и цветные сплавы.
5. Как черные, так и цветные металлы обладают эластичностью, тягучестью, ковкостью и прочностью.
6. Такие металлы, как медь, магний, никель и цинк придают сплавам особые свойства.
7. Титан обладает уникальными качествами и широко применяется в медицине.

8. Титан проявляет высокую устойчивость к коррозии, легкость, прочность на растяжение, но главным является инертность по отношению к биологической среде.
9. Легирующие элементы добавляются к другим металлам, чтобы создать новые, улучшенные свойства материала.
10. Известными легирующими элементами являются силикон, хром, свинец, висмут, селен и теллур.

Вариант 2.

1. Translate the original and derivative words, using a dictionary and create several new words by adding suffixes:

verb	noun (abstract)	noun (personal)	adjective
to improve	improvement	improver	<i>допускающий улучшение</i>
to divide	<i>делимость</i> division divisor	divider	dividual divisible divisional
to quench	quencher quenching	-	<i>незакаленный</i>
to temper	temper	-	-
-	susceptibility	-	susceptible <i>восприимчивый</i>
<i>подводить</i> <i>пригосудаться</i>	suit suitability	suitor	-

2. Translate the following word combinations with Gerund:

alloying material, alloying metal, quenching, alloying additions, tempering, alloying elements, hardening tool steel, alloying constituent, stamping die, metal cutting tool, cutting edge, tool steels are used for making tools, impact loading, milling cutter.

Text Steels

Steels are widely known and mostly used materials in comparison with any other ones. Steels are alloys of iron and carbon with other alloying elements. Carbon is the most cost-effective alloying material for iron, but various other alloying elements are used – manganese, chromium, vanadium and tungsten. The latter are necessary to improve many properties of steels – corrosion resistance, strength, formability and others. Mechanical properties of steels greatly depend on carbon content. According to this indication the steels are basically divided into three kinds: low carbon, medium carbon and high carbon.

Carbon is limited in low carbon steels and not enough to strengthen them by heat treatment, but only cold one. The micro-structure of low carbon steels consists of ferrite and pearlite, they are relatively soft, ductile and possess high toughness. They are weldable and easily machined. The typical applications of these steels are: structural shapes, tin cans, automobile body components, building, etc.

Medium carbon steels are stronger than low carbon steels, although are less ductile, but their strength can be improved by heat treatment. Usual heat treatment includes austenitizing, quenching and tempering. Such alloying additions as nickel, chrome and molybdenum improve

their hardness. The sphere of application of medium carbon steels is railway tracks and wheels, gears, the machine parts which require strength and toughness.

High carbon steels are the strongest and hardest and therefore their ductility is very limited. Their hardness is achieved with addition of such alloying elements as chrome, vanadium, molybdenum and bismuth. These steels possess very high wear resistance and are used for sharp edged tool application: knives, razors, hacksaw blades, etc.

The other parameter for classification of steels is amount of alloying addition. According to this criterion the steels are of two kinds: plain carbon steels and alloy steels. A special group of ferrous alloys with considerable amount of alloying additions is known as HSLA (high-strength low alloy steels). Common alloying elements are copper, vanadium, nickel, bismuth, chrome, molybdenum and others. These alloys are ductile, formable and applied in support columns, bridges, and pressure vessels.

Another widely used kind of steel is stainless steels. They are highly resistant to corrosion and are called rustles or stainless. Highly corrosion resistance is achieved by addition of special alloying elements, especially a minimum of 12 % chrome along with nickel and molybdenum. The typical application of such steels is cutlery, razor blades, surgical tools, etc. Besides, in engineering it is accepted to differ some other kinds of steels: structural steel, carbon steel, alloy steel, tool steel, self (air) hardening tool steel, heat-resisting steel, high speed steel.

Structural steel is widely applied because of its strength, toughness, workability, but it has two drawbacks – heavy weight and susceptibility to rust.

Carbon steel is steel where the main alloying constituent is carbon, and when no minimum content is required for chromium, cobalt, niobium, molybdenum, nickel, titanium, tungsten, vanadium or zirconium. High carbon steel is very strong and used for springs, high-strength wires, knives, axles, punches, stamping dies, metal cutting tools, etc.

Alloy steel is steel alloyed with other elements in amounts of between 1 and 50 % by weight to improve its mechanical properties. These steels have greater strength, hardness, hot hardness, wear resistance, hardenability and toughness compared to carbon steel. However, they require heat treatment in order to achieve such properties. Common alloying elements are molybdenum, manganese, nickel, chromium, vanadium, silicon and boron. Such steels are used where high corrosion resistance in certain environmental conditions is needed.

Tool steel refers to a variety of carbon and alloy steels that are particularly well-suited to be made into tools. Their suitability comes from their hardness, resistance to abrasion, ability to hold a cutting edge and resistance to deformation at elevated temperatures. Tool steels are generally used in a heat-treated state for making tools which have to withstand impact loading.

High speed steel (HSS) is basically iron – carbon alloy in which various elements, principally tungsten and molybdenum, have been added to improve their hardness, toughness, heat resistance and wear resistance. High speed steels are usually used in the manufacture of various cutting tools: drills, taps, milling cutters, tool bits, gear cutters, saw blades, punches and dies. High speed steel tools maintain their edge longer than carbon steel ones.

3. Complete the sentences:

1. Mechanical properties of steels depend on...
2. Depending on carbon the steels are divided into...
3. Steels are alloys of...
4. The micro-structure of low carbon steels consists of ...
5. The applications of low carbon steels are...
6. The strength of medium carbon steels can be improved by ...
7. The sphere of application of medium carbon steels is...
8. The hardness of high carbon steels is achieved with...

9. One of the parameters for classification of steels is the amount of...
10. Stainless steels are highly resistant to...

4. Insert the proper words into the sentences:

1. (Углерод) is the most (затратный) (легирующий материал).
2. Alloying elements are necessary (чтобы улучшить) (свойства) of steels.
3. Steels (широко известные) материалы.
4. Carbon steels are (свариваемые) and (легко обрабатываемые на станках).
5. Medium carbon steels (прочнее) than low carbon steels, but (менее ковкие).
6. (Прочность) of high carbon steels (достигается) with addition of some (легирующих металлов).
7. High carbon steels (обладают) very high (износоустойчивостью).
8. The steels are divided into (низкоуглеродистую) and (легированную).
9. High-strength low alloy steels have (значительное количество) of (легирующих добавок).
10. (Нержавеющая сталь) is widely used for (хирургических инструментов).

5. Find in the text the sentences that correspond to the following statements:

1. Carbon is the main constituent affecting the mechanical properties of steel.
2. Depending on carbon content the steels are divided into three types.
3. The main purpose of using alloying elements is to make steels strong and corrosion resistant.
4. The amount of carbon influences the mechanical characteristics of steels.
5. Carbon is the most expensive ingredient comparing with others.
6. The amount of alloying additions is one of the parameters that change the type of steels.
7. In machine building there are various types of steels.
8. Structural steel besides its advantages has also some drawbacks.
9. Alloy steel possesses higher characteristics and is used in the most difficult environmental conditions.
10. A lot of tools which need special strength are made of high speed steel.

6. Translate into English:

1. Стали – наиболее используемые материалы в машиностроении.
2. Сталь – это сплав железа и углерода.
3. Легирующими элементами стали являются многие металлы: магний, хром, ванадий, вольфрам, никель, алюминий и другие.
4. Добавки к железу меняют свойства сплавов.
5. Легирующие элементы нужны, чтобы улучшить свойства сталей.
6. Стали должны обладать такими свойствами, как прочность, устойчивость к коррозии, ковкость, обрабатываемость.
7. В технике существуют различные сорта сталей: нержавеющая, инструментальная, теплостойкая, высокопрочная, углеродистая.
8. Свойства стали зависят как от количества углерода, так и от количества добавочных элементов.
9. Одни стали должны выдерживать высокие температуры, другие – высокое давление.
10. Для различных строительных сооружений, инструментов и деталей машин используются соответствующие сорта сталей.