ЎЗБЕКИСТОН РЕСПУБЛИКАСИ
ОЛИЙ ВА ЎРТА МАХСУС ТАЪЛИМ ВАЗИРЛИГИ

НИЗОМИЙ НОМИДАГИ
ТОШКЕНТ ДАВЛАТ ПЕДАГОГИКА УНИВЕРСИТЕТИ

Supplementary Reader for Students of Industrial Faculty

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Аннотация:

Ушбу қўлланма табиий факультетларда чет тиллар бўйича ўқув дастури талабларига мувофиқ тузилган. Дастурий талаблардан бири инглиз тилида талабаларга ихтисослик матнларини ўқиб ахборот олишдан иборатдир. Қўлланма касб таълими факультети талабалари учун мўлжалланган.

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PREFACE

The aim of this work is to give students some information about famous people of England and the USA, the texts of their speciality.

Every special text contains vocabulary and grammar exercises. This supplementary reader is recommended to students of Industrial faculty of the 2nd and 3rd year of study.

Key words and word combinations are given after the texts. The reader includes special texts about machine-tools, engines, turbines, metals, transmission machine parts and so on. It is very useful to the independent work.

It is necessary to control the students' language habits and skills. The reader help to develop skills in reading and translating in English as well. We think that texts play an important role in enriching student's outlook.

Text 1

AIRCRAFT

1. Different types of aircraft are used nowadays still the basic structural design principles are the same. There are small light aircraft which carry one or two passengers and a few pounds of baggage which make up the entire payload of the aircraft. Large transport planes carry up to 300-350 passengers at a time. Cargo airplanes are designed to carry a great amount of cargo. It is obvious that we shall not analyse all of them. Our purpose was to familiarise students with the principal structural units of modern airplanes. We wanted to enable them to now how to perform properly the necessary maintenance of the equipment.

2. Usually the airplane consists of five principal structural units, namely: the fuselage, the main planes or wings, the power plant, the tail unit, the landing gear.

3. Aircraft designers always tried to increase the speed of the airplane. This process is endless. Now they are continuing to create new airplanes with increased speeds. It is obvious that in designing civil transport aircraft new demands of safety, reliability and endurance must be provided in parallel with the increase in speeds. Modern airplanes carry the large number of passengers and carry out different types of traffic. With such payloads nobody will ever excuse a catastrophic structural failure.

4. The designers throughout the world accepted this responsibility and formulated basic structural design principles long ago as following demands of safety, all weather and seasons flights, long life, ease of maintenance and inspection, minimum structure weight and high payload.

WORDS AND EXPRESSIONS

airplane design	- конструкция самолёта	- самолётнинг тузилиши
baggage	- багаж	- багаж, юк
cargo airplane	- грузовой самолёт	- юк ташувчи самолёт
gear	- шасси	- шасси
maintenance	- техническое обслуживание, эксплуатация	- хизмат қилиш
payload	- нагрузка	- ортилган юк
power plant	- силовая установка	- қурилма
principal structural units	- основные конструктивные элементы	- асосий тузилиш элементлари
tail-plane	- хвостовое оперение	- дум қисми
wing	- крыло	- қанот

EXERCISES

1. Translate the following words:

a few pounds of baggage, large transport planes, entire payload, a great amount of cargo, modern airplanes.

2. Complete the following sentences. Translate them into Russian or Uzbek.

1. Large transport planes carry up to …. 2. They are continuing to create …. 3. Aircraft designers always tried …. 4. Our purpose was to familiarize….

3. Read the following words. Point out what meaning they have in the text.

civil transport – гражданский транспорт, фуқаро транспорти; reliability – надёжность, ишонч; responsibility – ответственность, масъулият, жавобгарлик; light aircraft – легкая авиация, енгил авиация; maintenance of the equipment – эксплуатация оборудования, ускуналардан фойдаланиш.

4. Make up sentences with these words.

1. Principal, units, consists of, airplanes, structural, five. 2. Large, at a time, passengers, carry up, planes, 300-350, transport. 3. Such, nobody, with, payloads, will, ever, structural, excuse, failure, a catastrophic. 4. Gear, use, airplanes, landing, nowadays, retractable.

5. Find English equivalents in the text corresponding to the following:

1. Самолёт состоит из 5$^{\text{ти}}$ основных конструктивных элементов: фюзеляж, крылья, двигатель (силовая установка), хвостовой блок, убирающееся шасси. 2. Современные самолёты перевозят большое количество пассажиров и выполняют различные виды движения. 3. Мы хотели дать им возможность к настоящему моменту как следует выполнить необходимость эксплуатации оборудования. 4. Этот процесс бесконечный.

1. Самолёт 5 та асосий лойиҳавий жиҳозлардан ташкил топган: самолёт танаси, қаноти, юргизувчи механизм, дум қисми ва механизмлардан ташкил топган. 2. Замонавий самолётлар кўплаб йўловчиларни ташийдилар ва турли ҳаракатларни бажарадилар. 3. Ҳозирги пайтда ускуналардан фойдаланишлари учун биз уларга шароит яратиб бермоқчимиз. 4. Бу жараён чексиздир.

6. Answer the questions on the text.

1. Does the airplane consist of five principal structural units?
2. Who always tried to increase the speed of the airplane?
3. What airplanes carry the large number of passengers?
4. Do modern airplanes carry out different types of traffic?
5. Why our purpose was to familiarise students with the principal structural units of modern airplanes?
6. What do airplane designers try to increase nowadays?

7. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. Usually the airplane (состоит \ иборат) of five principal structural units. 2. It is obvious that we shall not (анализировать \ таҳлил қилмоқ) all of them. 3. Now they are continuing (создавать \ яратмоқ) new airplanes with increased speed. 4. Aircraft designers always (старались \ ҳаракат қилдилар) to increase the speed of the airplane.

8. Translate part 1-3 of the text in written form.
9. Give the summary of the text.

Text 2

MACHINE – TOOLS

1. The machine –tool is the principal manufacturing equipment in a machine shop. It is essential in the manufacture of every product from a giant turbine to minute jewels for aircraft instruments. One of the simplest tools is the ordinary drilling machine. It consists of a spindle which imparts rotary motion to the drilling tool, mechanism for feeding the tool into the work, a table on which the work rests, and a frame. The drilling machines or drill presses are grouped into the following 4 classes: sensitive, upright, radial and multi-spindle machines.

2. A milling machine is a machine-tool that removes metal as the work is fed against a rotating cutter. The lathe is a machine-tool which can perform a wide variety of operations.

3. It is primary used for turning and boring operations. In addition, the lathe can be used for drilling, reaming, tapping and by employing suitable adapters, operations of milling and grinding may be carried out without difficulty.

4. The lathe is the oldest machine-tool but it is still widely used. There are many types of lathes that differ in their size, design, method of drive arrangement of gears and purpose. According to the character of work performed, the design and construction lathes are divided into the following types: bench lathes, chucking lathes and automatic lathes. There are also screw machines, boring mills, crankshaft lathes, wheel lathes, etc.

5. All the machine-tools operate on either a reciprocating or rotary type principle: either the tool or work reciprocates or rotates. Cutting tools must be hard. A tool must also have the correct cutting angle, and the correct speed to cut satisfactorily.

6. Heat dissipation is another factor in considering the correct speed. The engine – lathe has a large range of spindle revolutions and of feeds and it can cut threads. The bench lathe is adopted to small work, having a maximum swing capacity of 9 inches. All lathes receive their power through the head stock which may be equipped either with a step-cone pulley drive or a geared head drive. The shaper is flexible machine in many respects complementing the lathe in work it performs. It has a reciprocating cutting tool, which takes a straight – line cut. It can produce flat surfaces and by means of special tools, attachments, and devices for holding the

work, a shaper can also cut external and internal keyways, spiral grooves, gear racks, dove-tails, T-slots and other shapes.

WORDS AND EXPRESSIONS

bench lathe	- токарный стол	- токарлик дастгоҳи
boring-mill	- бурильный станок	- пармалаш дастгоҳи
crankshaft lathe	- коленчатый вал	- тирсакли вал
cutting angle	- угловая фреза	- қиррали фреза
cutting tool	- фрезельный станок	- фрезель дастгоҳи
drilling	- бурение; высверливание	- бурғилаш; пармалаш
feeding	- передача	- узатиш
machine-tool	- механический станок	- механик станок
lathe	- токарный станок	- токарлик дастгоҳи
reciprocating engine	- поршневой двигатель	- поршень двигатели
reciprocator	- поршневая машина (машина с возвратно-поступательным движением)	- олд-орқага қўзғалувчи машина
wheel lathe	- зубчатое колесо	- тишли ғилдирак

EXERCISES

1. Translate the following words:

aircraft instruments, drilling machine, drill presses, a rotating cutter, boring operations.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. It consists of a spindle …. 2. The drilling machines or drill presses …. 3. The lathe is a machine-tool …. 4. It is primary used ….

3. Read the following words. Point out what meaning they have in the text.

Screw machines – винтовые устройства, парраклар тузилиши; to rotate – вращать, айлантирмоқ; angle – фреза, фреза; speed – скорость, тезлик; to operate – управлять, бошқармоқ.

4. Make up sentences with this words:

1. Can, for, the, tapping, drilling, lathe, reaming. 2. Are, construction, the, and, design, lathes, the, types, into, divided, following. 3. Tools, a reciprocating, operate, all, the, on, machine, either, or, type, rotary, principle. 4. Be, tools, must, hard, cutting.

5. Answer the questions on the text.

1. What is a spindle and what does it do?
2. What classes are the drilling machines grouped?
3. How do all the machine-tools operate?
4. What kind of lathe is adapted to small work?
5. From where do all lathes receive their power?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. The engine – lathe has a large (интервал \ оралиқ) of spindle revolutions and of feeds and it (может \ мумкин) cut threads. 2. The shaper is flexible machine (во многих отношениях \ кўп жиҳатдан) complementing the lathe in work it performs. 3. It can (производить \ ўтказмоқ) flat surfaces, and (посредством \ ёрдами билан) of special tools, attachments, and devices for holding the work, a shaper can also cut external and internal keyways, (спиральные \ спиралсимон) grooves, (зубчатые \ тишли) racks, dovetails, T-slots and other shapes. 4. A tool must also have the correct (угловой фрезы \ фреза қиррасини), and the correct speed to cut satisfactory.

7. Translate part 4-6 of the text in written form.
8. Give the summary of the text.

Text 3

TURBINES

1. The turbine is a machine for generating mechanical power from energy of the steam of fluid. Steam, hot air or gaseous products of combustion, and water are the most widely used working fluids. A steam turbine may be defined as a form of heat engine in which the energy of the steam is transformed into kinetic energy. It consists of the following fundamental parts: a) a casing or shell containing stationary blades; b) a rotor, containing the moving blades; c) a set of bearings; d) a governor and valve system for regulating the speed and power of the turbine. The main types of steam turbines are airflow turbines and radial – stage turbines.

2. The reciprocating steam engine came into its own during the nineteenth century, when it found greatest use in mills, locomotives and pumping systems. The modern steam turbine developed at the turn of the last century, is rapidly replacing the reciprocating engine for large installations. Gas is used as the working fluid in gas turbines.

3. The basic theory underlying their design and their operating characteristics is identical with that for steam turbines. The energy of water is converted into mechanical energy of a rotating shaft in hydraulic turbines. Power may be developed from water by 3 fundamental processes; by action of its weight, of its pressure or its velocity; or by a combination of any or all three.

WORDS AND EXPRESSIONS

arrangement installation	- устройство	- ускуналаш (ўрнатиш)
casing (shell)	- корпус (наружная часть машины)	- корпус (машинанинг ташқи қисми)
combustion	- сгорание	- ёниш, куйиш
fluid	- жидкость	- суюқлик
governor	- регулятор	- регулятор
moving blade	- двигательное крыло	- ҳаракатга келтирувчи қанот
radial – stage turbine	- радиально расположенная турбина	- радиал жойлашган турбина
rotating shaft	- двигательный вал	- ҳаракатланувчи вал
rotor	- ротор	- ротор
a set of bearings	- сборка подшипников	- подшипниклар йиғиндиси
steam engine	- паровая машина (паровой поршневой двигатель)	- буғ машинаси
stationary blade	- двигательное крыло	- ҳаракатланувчи қанот
valve	- клапан	- клапан, қопқоқ

EXERCISES

1. Translate the following words:

mechanical power, products of combustion, kinetic energy, pumping systems, hydraulic turbines, working fluid.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. A steam turbine may be defined as…. 2. The main types of steam turbines…. 3. The modern steam turbine developed …. 4. Gas is used as …. 5. The energy of water is converted ….

3. Read the following words. Point out what meaning they have in the text.

Fluid – жидкость, суюқлик; gaseous products – газообразные продукты, газсимон махсулотлар; speed – скорость, тезлик; transform – превращаться, айлантирмоқ; gas turbines – газовые турбины, газ турбиналари

4. Make up sentences with these words.

1. Following, consists, the, it, parts, of, fundamental. 2. A machine, power, the, turbine, for, is, generating, energy, fluid, of, the, of, steam, from, mechanical. 3. May,

as, defined, be, a steam, turbine, in of, a form, engine, heat, which, is kinetic, of, the, transformed, the, energy, steam, into. 4. By, power, be, from, fundamental, 3, water, may, developed, processes. 5. Gaseous, or, combustion, products, of, steam, air, hot, and, the, used, are, water, most, fluids, widely, working.

5. Answer the questions on the text.

1. What is the turbine?
2. What parts does the turbine consist of?
3. Where is the gas used?
4. Is the energy of water converted into mechanical energy of a rotating shaft in hydraulic turbines?
5. What processes does the power develop from water by?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. The turbine is a machine for generating mechanical power from energy of the (паровой \ буғи) of fluid. 2. A governor and valve system (для регулировки \ тартибга солиш учун) the speed and power of the (турбины \ турбинанинг). 3. The energy of water (превращается \ ўзгаради) into mechanical energy of a rotating (вала \ уюмининг) in hydraulic turbines. 4. The reciprocating (парового \ буғли) engine came into its own during the 19^{th} century, when it (нашел \ топиб олди) greatest use in mills, locomotives and (насосных \ насослар) systems. 5. (Газ \ газ) is used as the working fluid in (газовых \ газли) turbines.

7. Translate part 1-3 of the text in written form.
8. Give the summary of the text.

Text 4

ENGINES

1. The heat engine is a machine that converts heat energy to mechanical energy. The engines of motor-cars, motor-cycles, farm tractors, motor boats, etc., are heat engines, which belong to the subgroup of internal combustion engines. Combustion engines may be divided into several types according to the number of piston strokes. Most of the modern automobile engines operate on four stroke cycle. Cross section of a four-stroke SI engine is one of the main parts of engine. There are also engines which operate on 2-stroke and 6-stroke cycles.

2. A diesel engine is a machine which produces power by burning oil in a body of air which has been squeezed to a high pressure by a moving piston.

Diesel engines are especially suitable where an independent source of power is required, as in ships, locomotives, mobile equipment of all sorts and isolated power plant. Steam, gas and oil engines were known and used prior to the invention of the

diesel engine. The steam engine converts the heat energy of steam to mechanical energy. A typical steam reciprocation engine consists of a cylinder fitted with a piston. A connecting rod and crankshaft change the piston to-and-fro motion into rotary motion.

The steam pressure on the piston varies during the stroke and it is a flywheel which maintains a constant output velocity.

WORDS AND EXPRESSIONS

burning oil	- керосин	- керосин
connecting rod	- шатун	- шатун (тирсак)
crankshaft	- коленчатый вал	- тирсакли вал
diesel engine	- дизельный двигатель	- дизел двигатели
engine	- двигатель	- двигатель
flywheel	- маховик	- маховик
heat engine	- тепловой двигатель	- иссиқлик двигатели (иссиқ двигатель)
internal combustion engine	- двигатель внутреннего сгорания	- ички ёнишли двигатель
locomotive	- локомотив (паровоз, тепловоз)	- локомотив
mobile equipment	- подвижное оборудование	- ҳаракатланувчи ускуна
motor boat	- моторная лодка	- моторли қайиқ
motor car	- автомобиль	- автомобиль
motor cycle	- мотоцикл	- мотоцикл
moving piston	- двигательный поршень	- ҳаракатланувчи поршень
oil engine	- двигатель, работающий на тяжелом топливе	- оғир ёқилғи билан ишловчи двигатель
piston stroke	- ход поршня	- поршеннинг ҳаракати
to-and-fro motion, reciprocating motion	- возвратно-поступательное движение (ответное действие)	- олд-орқага қўзғалувчи машина
reciprocating engine	- поршневой двигатель	- поршен двигатели
squeeze	- сжатие (давка)	- сиқилиш, қисилиш (босим)
steam	- пар	- буғ
suitable	- подходящий	- муносиб, лойиқ

EXERCISES

1. Translate the following words:

the subgroup of internal combustion, cross section, source of power, equipment of all sorts.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. Combustion engines may be divided …. 2. The heat engine is a machine that converts …. 3. Most of the modern automobile engines operate …. 4. The steam engine converts the heat energy of steam ….

3. Read the following words. Point out what meaning they have in the text.

Belong – принадлежать, оид бўлмоқ, тегишли бўлмоқ; combustion engines – двигатели внутреннего сгорания, ички ёнув двигателлари; source – источник, манба; pressure – давить, эзмоқ, босмоқ

4. Make up sentences with these words.

1. The, modern, of, most, engines, on, cycle, automobile, operate, four, stroke. 2. The, motor-cars, motor-cycles, engines, of, are, engines, motor-beats, heat, farm-tractors. 3. Steam, and, were, engine, gas, oil, known, and, to, invention, the, prior, the, of, engine, diesel. 4. Rod, and, a connecting, change, piston, the, crankshaft, to, and, motion, fro, motion, into, rotary.

5. Answer the questions on the text.

1. What is the heat engine?
2. What kind of heat engines are belonged to subgroup of internal combustion engine?
3. What does the diesel engine produce?
4. Where are the diesel engines used?
5. What does the steam do?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. The heat engine is a machine that (превращает \ ўзгартиради) heat energy to mechanical energy. 2. A diesel engine is a machine which (вырабатывает \ ишлаб чиқаради) power by burning oil in a body of air which has been squeezed to a high pressure by a (двигательным \ двигатель) piston. 3. A typical steam (поршневого \ поршен) engine consists of a cylinder fitted with a piston. 4. The steam (давит \ эзади) on the piston varies during the stroke, and it is a flywheel which (поддерживает \ қувватлайди) a constant output velocity.

7. Translate part 2 of the text in written form.
8. Give the summary of the text.

Text 5

GEORGE STEPHENSON

1. George Stephenson was one of the most famous English engineer. He is a founder of the railway and the steam locomotive.

2. George Stephenson was in a coal – mining district in the north of England on 9 June, 1781. His father worked in a coal – mine and George often go to the pit to see the steam – pump at work. When he was 19, George determined to learn more about steam – engines. He read about the work of James Watt and other inventors.

3. In 1823 Stephenson was invited by his colleague, Edward Pease, to build a railway from Stockton to Darlington. On 27 September, 1825 the new railway was opened. Many people came to watch the opening of the 1st railway line. And the 1 st public passenger train in the world was drawn by Stephenson's Active, later renamed Locomotive.

4. Later on he made a railway engine called the «Rocket». The Rocket insured a place for the steam locomotive as a means of transport. For this engine he won a prize. George Stephenson died in 1848 at the age of 67.

WORDS AND EXPRESSIONS

coal-mining district	- угледобывающий район	- кўмир кони
pit	- шахта	- шахта
inventor	- изобретатель	- ихтирочи
steam-pump	- паровой насос	- буғ насоси
steam-engine	- паровоз	- паровоз
determine	- определять	- аниқламоқ
win	- выиграть	- ютмоқ
founder	- основатель	- асосчи

EXERCISES

1. Translate the following words:

steam locomotive, coal mine, the work of James Watt, a railway engine, a means of transport, won a prize.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. He is a founder of the railway and …. 2. His father worked …. 3. George often go to the pit ….4. He read about the work ….

3. Read the following words. Point out what meaning they give in the text.

To determine – определять, аниқламоқ; to build – строить, қурмоқ; opening – открытие, очилиш маросими; prize – приз, мукофот.

4. Make up sentences with these words.

1. People, the, opening, many, came, to, watch, railway, line, of, the 1st. 2. A place, as a means, insured, of, for, transport, the, steam, the, rocket, locomotive. 3. Engine, later, on, a railway, he, called, made, the, «Rocket». 4. A prize, for, won, he, this, engine.

5. Answer the questions on the text.

1) When and where was George Stephenson born?
2) Where did his father work?
3) When was his a railway opened?
4) When did he die?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. In 1823 Stephenson was invited by his (коллегой \ ҳамкасби) Edward Pease to build a railway from Stockton to Darlington. 2. The 1st public (пассажирский \ йўловчи) train in the world was drawn by Stephenson's Active, later renamed Locomotive. 3. He (выиграл \ ютиб олди) a prize. 4. George Stephenson (умер \ ўлди) in 1848 at the age of 67.

7. Translate part 3-4 of the text in written form.
8. Give the summary of the text.

Text 6

TRANSMISSION MACHINE PARTS

1. It is often necessary to join sections of long transmission shafts with coupling. These couplings are also required to connect the shaft or driving machine to a separately built driven unit.

2. Permanent couplings are refered to simply as couplings, while clutches max be readily engaged or disengaged. Universal joints permit the positive transmission of power between shafts intersecting at a comparatively large angle.

3. When the driving machine or machine member must rotate continuously and the driven member must be arranged to rotate or remain stationary as desired, a clutch must be used. There are many types of clutches. The simplest clutch is the jaw clutch.

4. It is widely used in automobile transmission. Other types of clutches are: plate friction clutches, cone clutches, and automatic clutch couplings. Gears are employed to obtain positive driving action without slippage. There are many types of gears.

5. Spur gears are most commonly used to connect parallel shafts and make them rotate in opposite direction. Helical gears differ from spur gears in that their teeth are

of helical or screw form. The herring – bone gear is equivalent to two helical gears, one having a right-hand and the other a left-hand helix.

6. Spiral – gears are cylindrical gears with helical teeth.
   They are used to connect screw shafts.
7. Crown wheels, bevel gears and worm gears must also be mentioned. The worm gears are used to connect screw shafts. The flywheel is employed to smooth out the speed fluctuations. The eccentric and the cam serve to produce some form of reciprocating or oscillating motion. The crank mechanism is employed to change the reciprocating motion to the rotary one, which gives rise to torque.

WORDS AND EXPRESSIONS

bevel gear	- коническое зубчатое колесо	- конус тишли ғилдирак
cam	- кулак	- мушт
clutches	- зубцы	- тишлар
coupling	- муфта	- муфта
crank	- коленчатый рычаг	- тирсакли ричаг
crown wheel	- храповое колесо	- конуссимон ғилдирак (етаклатувчи)
driving machine	- движущий станок (ведущий)	- ҳаракатлантирувчи дастгоҳи (машина)
fluctuation	- колебание	- тебраниш
flywheel	- маховик, маховое колесо	- маховик
gear wheel	- зубчатое колесо	- тишли ғилдирак
spiral gear	- спиральное, косозубное	- қиятишли ўқ
helical gear	колесо	(ғилдирак)
helix	- спиральная линия	- спиралсимон чизиқ
jaw clutch	- кулачковая муфта	- кулаксимон муфта
claw clutch		
rotary	- вращательный буровой станок	- айланма-пармалаш дастгоҳи
section	- поперечное сечение (шлиф)	- кўндаланг кесим, қирқим
shaft	- вал (шпиндель)	- вал
slip	- скольжение	- сирғаниш
screw shaft	- косой (асимметрический) вал	- эгри вал
screwed helix	- косая спираль	- эгри спираль
spur gear	- цилиндрическое прямолинейное зубчатое колесо	- цилиндрик тўғри тишли ғилдирак
transmission	- передача	- узатиш
torque	- момент вращения	- айланиш пайти
universal joint	- универсальный шарнир (шарнир Гука, кардан)	- универсал шарнир

EXERCISES

1. Translate the following words:

permanent couplings, universal joint, a left-hand helix, some form of reciprocating motion, rise to torque.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. Spur gears are most commonly used …. 2. The herring – bone gear is equivalent …. 3. When the driving machine or machine member must rotate …. 4. The worm gears are used …. 5. The crank mechanism is employed ….

3. Read the following words. Point out what meaning they have in the text.

Transmission – передача, узатиш; angle – угол, қирра: stationary – неподвижно, ҳаракатсиз, қўзғалмас; slippage – буксование, шатакка олмоқ, ёрдамлашмоқ; employ – применять, қўлламоқ.

4. Make up sentences with these words.

1. Sections, shafts, it, to, of, often, is, necessary, join, long, transmission, couplings, with. 2. In, used, widely, it, is, transmission, automobile. 3. They, to, shafts, connect, used, are, skrew. 4. The, to, employed, is, flywheel, the, smooth, to, out, fluctuations, speed. 5. Worm, the, are, gears, to, used, shafts, connect, skrew.

5. Answer the questions on the text.

1. How many types of clutches do you know?
2. Can you tell about gears?
3. Where are they widely used?
4. What is the difference between the worm gears and flywheel?
5. What is the crank mechanism and for what does the cam serve?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek

1. These couplings are also (требуются \ талаб қилинади) to connect the shaft or driving machine to a (отдельно \ алоҳида) built driven unit. 2. The simplest (муфта \ муфта (машина икки вални улайдиган жой)) is the jaw clutch. 3. Helical gears (отличаются \ фарқ қилади) from spur gears in that their teeth are of (спиральной \ спирал) or screw form. 4. (Храповые \ конуссимон) wheels, bevel gears and (червячные \ червякли) gear must also be mentioned. 5. The eccentric and the cam (служат \ хизмат қилади) to produce some form of reciprocating or (колебательного \ тебраниш) motion

7. Translate part 3-5 of the text in written form.
8. Give the summary of the text.

Text 7

THE CAPACITOR

1. A capacitor is an electrical device for storing quantities of electricity in much the same way that a reservoir is a container for storing water or a steel tank is a container for storing gas.

2. The general form of a capacitor is that of two parallel conducting plates. Such plates are of relatively large areas, close together, and contain between them a nonconducting medium called the dielectric. Common dielectrics are air, glass, oil and waxed paper. Quantitavely, the capacitance of a capacitor is a measure of its ability to store-up electricity. So increase the capacitance of a capacitor, one of the following changes can be made: first, the area of the plates may be increased; second, the plates may be put closer together, and the third, a more suitable dielectric may be installed between the plates. If the plates of a capacitor are small in area and at the same time relatively far apart, the capacitance is small. If the area is large and the plates close together, the capacitance is large.

3. The principles of the capacitor are as follows: one plate of the capacitor is grounded and the other is insulated, but connected to an electroscope or electromotor. If the right-hand plate is now given a negative charge, electrons in the other plate are repelled into the ground leaving that plate positively charged. If the installed plate is given a positive charge electrons from the ground are attracted to the other plate and its acquired a negative charge.

4. In either case the grounded plate is, by definition, at ground potential or sero potential. The right-hand plate is at negative potential, since, if connected to the ground, its electrons would escape into the ground.

5. If the two plates of capacitor are suddenly connected – by a conductor the negative charges can flow through the conductor to the positive charges, thus neutralizing the charges. The capacitor has thus been discharged.

6. During the time a capacitor is being charged, the plates acquire a greater and greater difference of potential. The unit of capacitance, the farad, named in honour of Michael Faraday, is defined as the capacitance of a capacitor of such dimensions that of one coulomb will give the plates a difference of potential of one Volt. A capacitance of one farad is very large and for practical purposes is not used.

7. The microfarad is more convenient. The smaller unit is one millionth of the farad and is abbreviated p.f.

8. Capacitors in common in use today are of various kinds, sizes and shapes. Perhaps the most common is the so-called «paper capacitor» used commonly in radios and the ignition system of automobiles.

9. Another type of capacitor is the rariable capacitor commonly used in turning radios. The capacitors of such a devise can be varied by the turning of a knob.

WORDS AND EXPRESSIONS

capacitance	-ёмкость	- сиғим, ҳажм
capacitor	- конденсатор	- конденсатор
charge	- загрузка	- загрузка (тўла банд бўлиш (юк билан))
convenient	- подходящий	- муносиб, лойиқ
device	- механизм	- механизм
ignition	- вспышка (зажигание)	- ёниш, ўт чиқиш (бирдан авж олиш)
medium	- середина	- ўрта, ўрталик
oil-paper	- промасленная бумага	- ёғли қоғоз
reservoir	- резервуар	- резервуар
waxed paper	- парафинированная бумага	- парафинланган қоғоз

EXERCISES

1. Translate the following words:

plate of the capacitor, negative charge, the right-hand plate, practical purposes, the ignition system.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. A capacitor is an electrical device for storing quantities of electricity in …. 2. Common dielectrics are …. 3. If the area is large and the plates close together …. 4. A capacitance of one farad is …. 5. Capacitors in common in use today are ….

3. Read the following words. Point out what meaning they have in the text.

Steel tank – стальной бак, пўлат идиши; relatively – соответственно, тегишли, лойиқ; insulate – изолировать, алоҳида қилмоқ, ажратмоқ; a capacitance – ёмкость, сиғим, ҳажм; in honour – в честь, шарафига.

4. Make up sentences with these words.

1. The, capacitor, of, quantitavely, is, a measure, a, of, its, electricity, to, ability, capacitance, store-up. 2. Are, common, air, dielectrics, glass, paper, and, oil, waxed. 3. The, of, are, principles, the, capacitance, follows, as. 4. Is, more, the, convenient, microfarad. 5. Type, of, is, the, another, capacitor, commonly, in, capacitor, rariable, used, radios, turning.

5. Answer the questions on the text.

1. What is a capacitor?
2. What can you say about the principles of the capacitor?

3. How is the negative charge acquired?
4. What is the farad and how is it defined?
5. What capacitors are used today?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. The general form (конденсатора \ конденсаторнинг) is that of two parallel conducting (пластин \ қатламларнинг). 2. So (увеличение \ кўпайтириш) the capacitance of a capacitor, one of the following (перемен \ ўзгаришлар) can be made. 3. If the installed plate is given a (положительный \ ижобий) charge, electrons from the ground (притягиваются \ тортилади) to the other plate and its acquired a (отрицательный \ салбий) charge. 4. The capacitor has (таким образом \ шу тариқа) been discharged. 5. The capacitors of such a device can be (разнообразным \ турли хил) by the turning of a knob.

7. Translate part 3-6 of the text in written form.
8. Give the summary of the text.

Text 8

METALS

1. Man has used metals for centuries, but only after the industrial revolution they became to be employed in really vast quantities. Today we know more than sixty-five metals, the majority of which are available in large quantities. With the increase in the number of metals has come an increase in the number of their alloys.

2. There are approximately five thousand alloys and each one of them possesses some special properties that makes it desirable for some particular purpose. Off all the metals iron remains the most important. Absolutely pure iron is rarely prepared except for laboratory purposes. The irons and steels we are used really alloys of iron, carbon and other substances. They can be made elastic, tough, hard, or comparatively soft.

The introduction of stainless steels has opened a new field. Indeed, there seems to be no limit to the number of different types of steel that can be produced.

3. Aluminium is light and easily worked. It can be rolled into sheets, or drawn into wire. It is easily welded and it can be produced as a fire powder. It is an excellent conductor of electricity and heat, it resists the corrosion of many acids, and can form a wide variety of alloys with other metals.

4. Tungsten is another metal the importance of which as a material has only recently been appreciated. Tungsten in small quantities makes the steel so hard that it can cut even when made white hot by friction.

5. Molybdenum is widely used as wire for electrical apparatus. One per cent of it produces a steel that is exceedingly hard and does not lose this hardness when it is heated to high temperatures.

6. Platinum is one the most useful metals and, if it were available in larger quantities, would be widely used for many purposes. It resists to acids, and it can be drawn into wire 1/50,000 th of an inch thick, invisible to the naked eye.

7. A magnetic alloy is made of irons, nickel, cobalt and aluminium, it magnetizes so powerfully that it can lift sixty times its own weight. Nickel and its alloys provide us with some of the hardest steels, and they play an important part in the constant buttle against corrosion.

This is a very brief survey of some of the metallic substances that science has much available to man.

WORDS AND EXPRESSIONS

acid	- кислота	- кислота
alloy	- сплав (металла)	- қотишма (металл қотишмаси)
available	- доступный (применимый)	- қўлланиш мумкин бўлган (қўлланадиган)
corrosion	- коррозия	- коррозия
friction	- сцепление	- уланиш
offal	- отбросы	- ташландиқ, чиқим
platinum	- платина	- платина (оқ олтин)
resist	- противостоять	- қарама-қарши турмоқ
rolling-mill	- прокатный станок	- прокат дастгоҳи
weld	- сваривать	- қайнатмоқ
wire	- провод	- сим

EXERCISES

1. Translate the following words:

vast quantities, special properties, some particular purpose, excellent conductor, variety of alloys.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. With the increase in the number of metals has come …. 2. Off all the metals iron remains …. 3. It is easily welded and it can be produced as …. 4. Aluminium is light and …. 5. Nickel and its alloys play an important part in ….

3. Read the following words. Point out what meaning they have in the text.

Resist – противостоять, қарама-қарши турмоқ; possess – обладать, эгалламоқ; elastic – упругий, таранг; stainless – нержавеющий, занглайдиган; brief survey – короткий осмотр, қисқа кўрик.

4. Make up sentences with these words.

1. We, today, more, know, metals, sixty-five, than. 2. The, metals, majority, of, in, quantities, large, are, available. 3. Alloys, five, are, thousand, there, approximately. 4. It, be, rolled, into, can, sheets, into, or, wire, drawn. 5. As, wire, is, widely, molybdenum, used, for, electrical, apparatus.

5. Answer the questions on the text.

1) What do you know about iron?
2) What metal is an excellent conductor of electricity?
3) What does tungsten do with the steel?
4) For what is molybdenum used?
5) What can you say about platinum?
6) What kind of metals are made a magnetic alloy?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. With the (увеличением \ кўпайиш билан) in the number of metals has come an increase in the number of their (сплавов \ қотишмалар). 2. Each one of alloys possesses some special (свойствами \ хоссалар билан) that makes it desirable for some particular (целей \ мақсадларга). 3. Tungsten is another metal the (важность \ муҳимлик) of which as a material has only recently been (оценен \ баҳоланди). 4. (Магнитный \ магнитли) alloy is made of irons, nickel, cobalt and aluminium. 5. This is a very brief survey of some of the metallic substances that science has much (достижений \ ютуқларга) to man.

7. Translate part 1-7 of the text in written form.
8. Give the summary of the text.

Text 9

ELECTRICITY

1. Electricity has been known since the days of the ancient Greeks. The word «Electricity» comes from the Greek word for amber. The Greeks discovered that, if a piece of amber was rubbed with fur, it would pick up bits of Straw or other light-weight materials. Later scientists discovered that other materials would act like amber. They could be given charges of electricity. Charges of this kind are called charges of frictional, or static, electricity. They are not very useful.

2. In 1800 an Italian scientist named Volta found a way of getting an electric current. He invented an electric cell. But electricity became truly useful after Michael Faraday invented a machine to push electrons an their way. A machine which

furnishes a current of electricity is called a generator. Today we use both cells and generators.

3. A battery is made up of 2 or more electric cells joined together. We use batteries in such things as portable radios, flashlights, electric games, and automobiles. The current which comes to our houses, stores and offices and lights our streets comes from generators.

4. In buying and rising electrical appliances there are some terms everyone needs to know. «Volt» is one. «Ampere» is another. «Watt» is a third. The push that forces a current through a circuit is measured in Volts. A volt is measure of electrical force. Most house hold appliances are built for a Voltage of either 127 or 220.

5. An ampere is measure of the strength of current. Electric lamp bulbs are marked in Watts.

A Watt is measure of electrical power. A kilowatt is 1,000 watts.

WORDS AND EXPRESSIONS

amber	- янтарь	- янтарь (қаҳрабо)
ampere	- ампер	- ампер
appliances	- приборы	- асбоблар
battery	- батарея	- батарея
cell	- элемент	- элемент
charges	- заряды	- зарядлар
flashing-light	- мигающий свет	- милтиллаган ёруғлик
frictional electricity	- электрическое трение	- электр ишқаланиш (ишқалиши)
furnish	- снабжать	- таъминламоқ
generator	- генератор	- генератор
portable	- транспортабельный (передвижной)	- кўчма
push	- толчок (давление)	- туртки (босим)
volt	- вольт	- вольт
watt	- ватт	- ватт

EXERCISES

1. Translate the following words:

a piece of amber, light-weight materials, charges of frictional, a current of electricity, a measure of electrical power.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. The word «Electricity» comes from …. 2. Later scientists discovered that … 3. A battery is made up of …. 4. A machine which furnishes a current of electricity is …. 5. An ampere is measure of ….

3. Read the following words. Point out what meaning they have in the text.

Amber – янтарь, қаҳрабо; furnish – снабжать, таъминламоқ; appliances – приборы, асбоблар; a current – электрический ток, электр токи; power – мощность, қувват.

4. Make up sentences with these words.

1. They, given, charges, could, be, of, electricity. 2. They, not, useful, very, are. 3. But, truly, after, electricity, useful, became, Michael, Faraday. 4. The, forces, a, that, push, current, a, through, circuit, is, volts, in, measured. 5. The, our, current, comes, lights, from, streets, generators, houses, offices.

5. Answer the questions on the text.

1. What is electricity?
2. What did the scientists discover later?
3. What is a generator?
4. From what is a battery made?
5. In what is the electric bulbs marked?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. Electricity has been known (со времён \ ўша пайтдан) of the ancient Greeks. 2. In 1800 an Italian scientist named Volta (нашёл \ топди) a way of getting an electric current. 3. A machine which (снабжает \ таъминлайди) a current of electricity is called a generator. 4. We use batteries in such things as portable, radios, (фонарики \ фонуслар), electric games and automobiles. 5. There are some terms everyone (нуждается \ муҳтож бўлади) to know.

7. Translate the 1st and 4th parts of the text in written form.
8. Give the summary of the text.

Text 10

THOMAS ALVA EDISON (1847-1931.

1. Thomas Alva Edison is one of the most famous engineers who ever lived. He was born in Ohio in 1847, and spent all his life in America.

2. Edison learned telegraphy and he became a telegraph operator. He didn't sleep more than 4 hours a night, because he liked to read technical books. Night after night he read the «Book of Experiments» by Michael Faraday. He wanted to improve the telegraph system and worked very hard in Boston.

3. His first invention was a transmitter of a new kind. His second contribution was improvement of the electric lamp and elaboration of a method of manufacturing it. In his fifty years he took out over thousand patents, most of them in various fields of electrical engineering.

4. The incandescent lamp was first invented by the Russian engineer A.N.Lodygin: but Edison succeeded in devising a form of it that was durable, cheap and suited to mass production. He tried 6.000 different materials before he hit upon the carbonized thread. Edison is also responsible for the ingenious system of electric light distribution which made possible the widespread use of his lamps.

5. Edison was a self-taught man. His formal education was limited to three months in public school.

6. His importance in the development of technology was immense. Today we can really appreciate the contribution he made and range his name among those of the world's foremost men of science. Edison died on October 18, 1931 at the age of 84 and his name is widely known throughout the world.

WORDS AND EXPRESSIONS

devising	- изобретение	- ихтиро қилиш
durable	- прочный	- мустаҳкам, пишиқ
foremost	- передовой	- илғор
hit upon	- натолкнуться	- дуч келмоқ
incandescent lamp	- лампа накаливания	- қизитиш лампаси (қизитилган лампа)
involve	- вовлекать	- жалб қилмоқ
succeed	- достичь цели	- мақсадга эришмоқ
widespread	- широко-распространенный	- кенг тарқалган

EXERCISES

1. Translate the following words:

a telegraph operator, electrical engineering, a self-taught man, widely known, mass production.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. His name is widely known …. 2. He took out over …. 3. The most famous of all his contributions was …. 4. Edison was ….

3. Read the following words. Point out what meaning they have in the text.

Contribution – вклад, хисса; electrical engineering – электротехника, электротехника; responsible – ответственный, масъул; manufacturing – производство, ишлаб чиқариш; thread – нарезка, қирқим.

4. Make up sentences with these words.

1. Engineer, lamp, the, incandescent, by, the, was, first, A.N.Lodygin, invented. 2. Production, this, and, lamp, cheap, mass, suited, to, durable. 3. The, he, carbonized, upon, thread. 4. System, also, is, responsible, Edison, light, the, for, ingenious, distribution, of, electric.

5. Answer the questions on the text.

1. Who was Alva Edison?
2. Where did he spend his life?
3. When was he born?
4. What did he devise?
5. He was a self-taught man, wasn't he?
6. Where did he study?
7. When did he die?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

1. His formal (образование \ маълумот) was limited to three months in public school. 2. His (важность \ муҳимлик) in the development of technology was immense. 3. We can really (оценить \ баҳолашимиз) the contribution he made and range his name among those of the world's foremost men of (науки \ фаннинг). 4. Edison died on October 18, 1931 (в возрасте \ ёшида) of 84.

7. Translate the sentences into English.

1. Эдисон был самообразованным человеком. 2. Лампа накаливания впервые был изобретен русским инженером А.Н.Лодугиным. 3. Эдисон всю свою жизнь провел в Америке. 4. Самым известным из всех его вкладов было усовершенствование электрической лампы. 5. Форма была прочной, дешёвой и удобной для массового производства. 6. Эдисон умер 8го октября 1931 года

1. Эдисон ўқимишли бўлган. 2. Қизитиш лампасини биринчи бўлиб рус муҳандиси А.Н.Лодугин яратган. 3. Эдисон бутун ҳаётини Америкада ўтказган. 4. Унинг энг катта хиссаси бу электр лампасини такомиллаштиришидир. 5. Шакл ишлаб чиқаришга қулай, арзон ва мустаҳкам эди. 6. Эдисон 8 октябр 1931 йилда вафот этган.

8. Translate part 3-6 of the text in written form.
9. Write a short content summary of the text.

Text 11

STRENGTH OF MATERIALS

1. From the earliest times when people started to build, it was found necessary for them to have information regarding the strength of structural materials so that rules to determine safe dimensions of members could be drawn up. The Egyptians are believed to have some rules of this kind, for without them it would have been impossible to erect their great monuments and pyramids, some of which still exist. The Greeks further advanced the art of building. The Romans are considered to have been great builders too. They are known to have used arches in their buildings. But they are unlikely to have known how to select the proper shape, as they usually took semicircular arches of a rather small span. Most of the knowledge that the Greeks and Romans had got in structural engineering was lost during the Middle Ages, and only since the Renaissance has it been recovered.

2. Leonardo da Vinchi (1452 – 1519) is known to be the most outstanding man of that period. He was not only the leading artist of that time, but also a great scientist and engineer. He proved the strength of beams supported at both ends to vary inversely as the length and directly as the width. The first attempts to find safe dimensions of structural elements were made in the 17th century. Galileo's famous book «Two New Sciences» is said to represent the beginning of the science of strength of materials. The further development of this branch of science was due to the works of Coulomb, Naveer Rankine, Mohr and other scientists of the western countries. Still in the 18th century and especially since the middle of the 19th century a very valuable contribution to science has been made by Russian scientist (Euler, Zhuravsky, Krylov and others). They paid particular attention to the problems of stability and the theory of thin walled members.

WORDS AND EXPRESSIONS

beam	- перекладина	- тўсин
to combine	- связывать	- алоқа боғламоқ
dimension	- измерение (величина)	- ўлчаш, ўлчов (миқдор)
to erect	- воздвигать	- қурмоқ, кўтармоқ, ўрнатмоқ
inversely	- обратный	- қайтиш, қайтадиган
member	- деталь	- деталь, қисм
semicircular	- полуокружность	- ярим айлана
shape	- форма	- шакл
span	- пролёт	- оралиқ
structural element	- элемент конструкции	- элемент тузилиши
width	- ширина (широта)	- кенглик

EXERCISES

1. Translate the following words:

structural materials, great builders, the strength of beams, to the problems of stability, a very valuable contribution.

2. Complete the following sentences . Translate them into Russian or Uzbek.

1. The Greeks further advanced …. 2. The Romans are known to have used …. 3. He was not only the leading artist of that time, but also a …. 4. Galileo's famous book «Two New Sciences» is said to …. 5. They paid particular attention to the problems of ….

3. Read the following words. Point out what meaning they have in the text.

Regarding – относительно, нисбатан; determine – устанавливать, ўрнатмоқ; proper shape – правильная форма, тўғри шакл; semicircular – полуокружность, ярим айлана; arches – арки, арклар.

4. Make up sentences with these words.

1. Times, from, the, when, earliest, to, build, people, started, found, it, necessary, was, for, have, to, them, regarding, of, materials, information, the, strength, structural. 2. The, are, Romans, to, considered, have, too, been, great, builders. 3. Leonardo, da, is, known, Vinchi, the, to, most, be, man, period, outstanding, of, that. 4. The, attempts, safe, first, to, dimensions, find, elements, of, structural, in, were, the, made, 17^{th}, century. 5. Since, the, 19^{th}, of, the, middle, century, a, very, to, science, valuable, contribution, made, by, has, Russian, been scientist.

5. Answer the questions on the text.

1. When was the information about the strength of structural materials found?
2. When was the structural engineering lost and has it been recovered?
3. Who was Leonardo da Vinchi?
4. What did he prove that time? (What work did he make?)
5. Who has been made the contribution to science in the middle of 19^{th} century?
6. To what did they particular attention?

6. Use the English words instead of words given in brackets. Translate the sentences into Russian or Uzbek.

3. 1. Egyptians are believed to have some rules of this kind, for without them it would have been (невозможно \ мумкин эмас) to erect their great monuments and

pyramids, some of which still (существуют \ мавжуд). 2. The Romans are unlikely to have known how (выбирать \ танлаб олишни) the proper shape. 3. He (доказал \ исботлади) the strength of beams supported at both ends to vary inversely as the (длине \ узунасига) and directly as the (ширине \ энига). 4. The further (развитие \ ривожланиши) of this branch of science was due to (работам \ ишларига) of Coulomb, Naveer Rankine, Mohr and others. 5. A very valuable contribution to science has been made by Russian (учёными \ олимлари), which paid attention to the (проблемам \ муаммоларга) of stability and the (теории \ назарияси) of thin walled members.

7. Translate part 2 of the text in written form.
8. Give the summary of the text.

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