

12.11.
A) Translate into Bosnian (lekcija 7)

- Ductility is a measure of the ability of a metal to plastically deform without fracture. Ductility is generally associated with tensile properties or the ability to be cold drawn as in wire drawing. Ductility is desirable in a member or part which may be subjected to sudden and severe loads, since evident excessive deformation would give a warning of impending failure.
- Malleability is very similar to ductility, except that it is applied to compression. Thus, this property enables a material to undergo great change in shape without rupture under compressive stress, as for example, copper, aluminium, or wrought iron being hammered into various shapes or steel being rolled into structural shapes or sheets.
- Plastičnost je mjera sposobnosti metala da se plastično deformiše bez loma. Duktinost je općenito povezana sa zateznom osobinom ili sposobnosti hladnog vučenja kao kod vučenja žice. Duktinost je poželjna kod mašinskih elemenata ili dijelova koji mogu biti podvrgnuti iznenadnim i teškim opterećenjima, tako da očigledna prekomjerna deformacija može biti upozorenje na predstojeći otkaz.
- Kovnost je veoma slična duktilnosti, osim što se ona odnosi na sabijanje. Tako, ovo svojstvo omogućava materijalu da pretrpi znatne promjene u obliku bez loma pod uticajem pritisnih napona, kao npr. bakar, aluminijum ili mekog željeza pri njihovom inertovanju u različite oblike ili kod čelika kad se valja u konstruktivne oblike ili limove.

B) Translate into English

- ① Temperature changes are produced by the addition or subtraction of heat from a body.
- Temperature changes are produced by the addition or subtraction of heat from a body.
- ② Rotacija je kretanje kod koga se sve čestice tijela kreću u krugovima oko zajedničke ose zajedničkom ugaonom brzinom.
- Rotation is a motion in which all particles of a body move in circles about a common axis with a common angular velocity.
- ③ Vratila se koriste na razne načine i različite svrhe kod svih vrsta mehaničke oprem.
- Shafts are used in various ways and for various purposes in all kinds of mechanical equipment.
- ④ Čvrsto tijelo je stanje tvari kod koga tvar posjeduje i određeni volumen i određeni oblik.
- A solid is a state of matter in which the substance possesses both definite volume and definite shape.
- ⑤ Ove promjene su beznačajne.
- These ^{changes} relations are insignificant. These relations are unimportant.

C) Turn the following adjectives into nouns.

- elastic - elasticity
- rigid - rigidity
- compact - compactness
- hard - hardness
- angular - angle

D) Miscellaneous

1. Turn the following sentences into Passive Voice, if possible.
 - a) We refer to these forms as forms of potential energy.
- These forms are referred as forms of potential energy.
 - b) The force moves through a distance. NE
2. Replace the underlined Past Participle Forms (Ved) by the corresponding Relative Clauses:
 - a) the average power accomplished by an agent.
- the average power which is accomplished by an agent.
 - b) the total work performed by an agent
- the total work which is performed by an agent.
3. Turn the following sentences into NPs:
 - a) Fluids are stagnant.
- stagnant fluids
 - b) The pyrometer is optical.
- the optical the pyrometer.
4. Insert the prepositions: of (2x), by and for in the following phrases as the sense requires and underline the noun heads which are modified by the newly formed prepositional phrases:
 - a) the production of heat by friction.
 - b) other devices for measurement of temperature.
5. Write in full words how the following values are read in English:
 - a) \sqrt{d} - square root of d.
 - b) x^{n-1} - x to the nth minus one.
6. Give adjectival forms of the following nouns:
 - a) sphere - spherical
 - b) square - square
7. Write the following compound in more descriptive way:
 - a) machine parts - parts of machine
 - b) deforming force - force of deformation.
8. Name the underlined phrase, analyze its form and the function of this phrase within the sentence:
They produce a considerably greater reduction in one stroke

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9. Replace the Present Participles and Past Participles by Relative Clauses:
 - a) Rigid couplings are used for shafts having good collinear alignment.
- Rigid couplings are used for shafts which have good collinear alignment.
 - b) Splines are series of teeth cut into the surface of a shaft in the axial direction.
- Splines are series of teeth which are cut into the surface of a shaft in the axial direction.
10. Underline the subject noun phrase in the following sentences:
 - a) The proportionality of stress to strain is expressed as the ratio of unit stress to unit strain.
S.N.P.
 - b) The amount of deformation produced in a given member by a given force will vary with the stiffness of the material of which the member is made.

A) Translate into Bosnian: (lekcija 10)

Two shafts can be connected by shaft couplings of which there are many varieties. The angle between two shafts, transmitted power, torsional and lateral vibrations, shock loads, and so on, are all parameters that must be considered in selecting a coupling to connect the shafts. Couplings used to join the shaft of an electric motor to the line shaft of a machine or hydraulic turbine to an electric generator are examples of Permanent Couplings, because their connections would only be broken for repairs and/or general maintenance.

- Dva vratila mogu biti povezana spojnicom za vratila od kojih postoje mnoge vrste. Ugao između dva vratila, prenosna snaga, uvojne i poprečne vibracije, udarna opterećenja itd., su sve parametri koji moraju biti razmotreni u izboru spojnice za spajanje vratila. Spojnice koje se običavaju koristiti za spajanje vratila elektromotora sa transmisionim vratilom mašine ili hidraulične turbine sa električnim generatorom su primjeri stalne spojnice, jer se mogu ^{rastavljaju} rastaviti samo u slučaju popravke ili generalnog remonta.

Stalne spojnice se dijele u dvije grupe:

1. krute spojnice i
2. fleksibilne spojnice.

Krute spojnice se koriste za vratila koja imaju dobru kolinearnu suosnost moraju biti postavljeni sa pažnjom i predostrožnošću.

- Permanent couplings are classified into two groups: 1. rigid couplings and 2. flexible couplings.

Rigid couplings are used for shafts having good collinear alignment and must be installed with care and forethought.

B) Translate into English

- ①) Tečnost je agregatno stanje u kome tvar nema određen oblik nego uzima oblik posude u koju je smještena.
- A liquid is a state of matter in which the substance has no definite sh but takes the shape of the vessel in which it is placed.
- ②) Kinetička energija je energija koja se vezuje za mehaničko kretanje tijela.
- Kinetic energy is the energy associated with mechanical motion of bodies.
- ③) Općenito, što više toplote dodajemo datom tijelu utoliko više raste njegova temperatura.
- In general, the more heat we add to a given body the more its temperature rises.
- ④) Napon se tako stvara u svim tijelima na koja djeluju sile pošto čak i najslabija sila donekle deformiše tijelo.
- Stress, then, is produced in all bodies upon which forces act, since even the slightest force to some extent changes the form of the body upon which it acts

C) } Kao u testu 1.
D) }

test 3

u) subtract → subtraction
 add → addition
 multiply → multiplication
 divide → division

A) } Može biti kao u testu 1 ili 2.
 B) }

C) Add A and B. The result of addition is called the sum or the total.

D):

1) Underline the predicates in the following sentences:

- a) Ductility is a measure of the ability of 'a metal to plastically deform without fracturing
- b) Thus this property enables a material to undergo great change in shape without rupture.

2) Replace underlined form by corresponding relative clause:

- a) Wrought iron being hammered into various shapes.
- wrought iron which is being hammered into various shapes.
- b) a basic principle of thermodynamics known as
- a basic principle of thermodynamics which is known as

3) Put the following sentences into First Conditional

- a) If the weight W (act) downwards, this force (be transmitted) to the circumference of the spindle.
- If the weight W acts downwards, this force will be transmitted to the circumference of the spindle.
- b) If the spindle (turn) in a clock wise direction, the toothed wheel (turn) in the same direction.
- If the spindle turns in a clockwise direction, the toothed wheel will turn in the same direction.

4) What are the equivalents of there is in:

- a) Past simple - there were (was)
- b) Future - there will be
- c) Present perfect - there have been

5) What is the active form of the following sentences:

- a) Various types of foils have been introduced. (by workers)
- Workers have introduced various types of foils.
- b) Some other materials with same properties are being used now. (by engineers)
- Engineers ^{are} used same other materials with the same properties.

6) Introduce CAN into the following passive phrases and make necessary changes:

- a) X are produced - can be produced
- b) X will be considered. - can be considered.

7) Underline the subject noun phrases in the following sentences:

- a) The most important concepts dealt with in the science of strength of materials are: stress and strain.
- b) This motion may be either free or constrained.

8) Reduce the following Active relative clauses:

- a) The external forces which are acting on a member ...
- The external forces acting on a member ...
- b) Potential energy which exists in the nuclei of atoms ...
- Potential energy existing in the nuclei of atoms ...

Test 4.

A) Translate into Bosnian (čelik): 1

Motion is a progressive change of position of a body. The motion of a body may be one of pure translation or pure rotation. The general motion of a rigid body, however, is a combination of translation and rotation. Translation is a motion in which all points of a system have identical displacements. If each point moves on a straight line, the translation is rectilinear, if on a curve, it is curvilinear.

Rotation is a motion in which all particles of a body move in circles about a common axis with a common angular velocity. This motion may be either free or constrained, as illustrated, respectively, by the earth turning on its axis, and by a flywheel or a pendulum.

- Kretanje je stalna promjena položaja tijela. Kretanje tijela može biti čista translacija ili čista rotacija. Opšte kretanje ^{krutih} tijela je kombinacija translacija i rotacije. Translacija je kretanje pri kojem sve tačke sistema imaju isti pomak. Ako se svaka tačka kreće po pravoj liniji translacija je pravolinijska, a ako po krivoj liniji onda je translacija krivolinijska.
- Rotacija je kretanje kod koga se sve čestice tijela kreću po krugovima oko zajedničke ose zajedničkom ugaonom brzinom. Ovo kretanje može biti slobodno ili ^{ograničeno} prinudno što se može prikazati, redom: obrtanjem zemlje oko svoje ose i kretanjem zamajca ili klatna.

B) Translate into English

1. Materijal napregnut preko njegovog elastičnog limita vraća se samo djelimično u svoj prvobitni oblik po potpunom uklanjanju sile deformacije.
- A material stressed beyond its elastic limit will return only partially to its original form upon complete removal of the deforming force.
2. Kod krutih ali elastičnih materijala kao što je čelik nalazimo da dati jedinični napon stvara relativno malu jediničnu deformaciju.
- In a stiff but elastic material such as steel, we find that a given unit stress produces a relatively small unit deformation.
3. Prvi korak u proizvodnji čelika je prečistiti željeznu rudu od neželjenih nečistoća.
- The first step in the production of steel is to refine the iron ore ^{containing} many unwanted impurities.
4. Sporost ovog procesa čini mogućim visok stupanj kontrole kvalitete.
- The slowness of the process makes possible a high degree of control of the quality.
5. Koks sagorjeva i proizvodi dovoljno toplote da otopi gvožđe.
- The coke burns and produces enough heat to melt the iron.

3) Write two word compounds from the following

a) Thermometer with gas. - Gas thermometer.

b) Regions of combustion. - combustion regions.

4) Underline the subject noun phrase in the following sentences

a) In this process, liquid iron is refined in a bottom-air-blowing vessel.
N.P.

b) Violent stirring of the molten charge, as indicated by the arrows, is produced by the interaction of eddy currents with the high frequency field.
N.P.

5) Write down the noun forms of the following verbs:

- eliminate - elimination

- remove - removal

- refine - refinement

- open - opening

6) Say the following in a more descriptive way:

a) A pear shaped container.

- a container in the shape of a pear.

b) Large diameter carbon electrodes.

- A electrodes made of carbon with diameter which is large.

7) Turn the following sentence in Future and Present Perfect:

a) There are many casting methods.

- There will be many casting methods.

- There have been many casting methods.

8) Rewrite the sentences below by extending their relative clauses properly:

a) Rigid couplings are used for shafts having good colinear alignment.
(alignment)

- Rigid couplings are used for shafts which have good colinear alignment.

b) Kinetic energy is the energy associated with mechanical motion of the bodies.

- Kinetic energy is the energy which is associated with mechanical motion of the bodies.

9) Write down the plural forms:

- information - informations

- phenomenon - phenomena

- stress - stresses

- equipment - equipments

10) Analyse the following noun phrase:

the metallic charge which was placed there

the: det. Pre.H. ↓ adj. N.P. ↓ post.H. relative clause
noun

11) Turn the following sentences into the Preterite Simple Passive:

a) The material absorbed a certain amount of energy.

- A certain amount of energy was absorbed by the material.

b) Engineers used some other materials with the same properties.

- ^{Some} Other materials with some properties were used by engineers.

Test 5

A) Translate into Bosnian. (lekcija 7)

Strength is the ability of a material to resist stress without failure.

Several materials, such as structural steel, wrought iron, aluminum, and copper, have approximately equal strength in tension and compression, while their strength in shear is about two-thirds of that in tension. The measure of the strength of a material is its ultimate stress, or the greatest force per unit area it can withstand without rupture.

Elasticity is that property of a material whereby a body, when deformed, automatically recovers its original size and shape after removal of a deforming force. This property is important in all structures subjected to varying loads and is exceedingly important in precision tools and machines.

- Čvrstoća je sposobnost materijala da se opire naprezanju bez loma. Nekoliko materijala kao što su konstrukcioni čelik, meko željezo, aluminijum, bakar imaju približno jednaku čvrstoću na zatezanje i pritisak, dok je njihova čvrstoća na smicanje oko 2/3 one na zatezanje. Mjera jačine materijala je zatezna čvrstoća odnosa najveće sile po jedinici površine koju može izdržati bez pucanja.

Elastičnost je ono svojstvo materijala pomoću kojeg tijelo, koje je deformirano, automatski vraća svoju početnu veličinu i oblik nakon uklanjanja deformirajuće sile. Ovo svojstvo je važno kod svih konstrukcija izloženih promjenjivim opterećenjima i veoma važno kod preciznih alata i mašina.

B) Translate into English:

1. Ova sila se može smatrati fizičkim agensom koji prouzrokuje takve promjene.
- This force can be considered as physical agent which causes such changes.

2. U stvari, to su naponi koje nemožemo nazvati ni zatezni ni pritiski jer djeluju paralelno sa površinom pod naponom.

- Actually, those are the stresses which can't be referred to as neither tensile nor compressive, because the stressed plane lies parallel with the direction of stress.

3. Da li je materijal koji se zagrijava uključen u zatvoreno električno kolo?

- Is the material being heated included in a closed electrical circuit?

4. Da bi se dobio finalni proizvod neophodni su daljnji postupci finalizacije.

- To obtain an end product further finishing processes is necessary.

5. Neosporno je da je vratilo, kao mašinski element izloženo promjenjivim opterećenjima prouzrokovanim nekolicinom različitih uzoraka.

- It is unquestionable that a shaft, as machine element, is subjected to fluctuating loads caused by several different causes.

C) Write down the noun forms of the following verbs:

- eliminate - elimination

- remove - removal - ukloniti

- refine - refinement

- combine - combination

- add - addition

- resist - resistance - oduprijeti se

1) What is the functional difference between the following underlined forms:

a) The iron coming out of the blast furnace ...
= koji izlazi iz visoke peći

b) coming out of the blast furnace the iron is topped ...
= izlazeći iz visoke peći

2) Give plural forms of these nouns:

information - information

phenomenon - phenomena

3) Read out the following equations:

$W = \int_a^b F \cos \theta ds$ = The work W is equal to integral between ^{the} limits a and b of force F times cosine angle θ times displacement ds.

$x = \frac{a+b}{c}$ = The X is equal to a plus b over c.

4) Give antonyms of the following words:

partially - completely

significant - insignificant

5) Underline the subject noun phrase in the following sentences:

- An action that changes the shape of the body upon which it acts is referred to as force.

6) Turn following sentences into Preterite simple Passive:

a) Engineers used some other materials with the some properties.

- Some other materials with the some properties were used by engineers.

b) We subjected all precision tools produced lately to varying loads.

- All precision tools produced lately to varying loads were subjected by ^{us} us.

odvirgati
odvirati

7) Insert, an appropriate comparative or superlative form of the adjectives in parentheses:

- This material has been proved the best to with stand the sudden shock. (good)

- With farther additions of carbon, the ductility falls off. (far)

8. Giving adjectival forms:

rectangle - rectangular

cube - cubical

9. Shorten the underlined part of the following sentence without changing its sense

- They will still require further finishing operations in order to obtain an and product.

They will still require further finishing operations to obtain an and product.

10. Fill in the blanks with the following propositions: to, from, in, by, of, upon, with.

a) This definition immediately calls for an explanation of work.

b) These shapes conform to the official safety standard.

A) Translate into Bosnian: (lekcija 5)

- Only two stresses exist: 1) normal stresses, which always act normal (perpendicular to the stressed surface under consideration, and, 2) shearing stresses, which act parallel to the stressed surface. Normal stresses may be either tensile or compressive. Other stresses either are similar to these basic stresses or are a combination of them. For example the stresses in a bent beam, generally referred to as "bending stresses" actually are a combination of tensile, compressive and shearing stresses. Torsional stress, as encountered in the twisting of a shaft, is a shearing stress.
- When the external forces acting on a member are parallel to its major axis and the member is of constant cross section, or substantially so, the resulting internal stresses are likewise parallel to that axis; such forces are called axial forces, and the stresses are referred to as axial stresses.

- Postoje samo dva napona: 1) normalni napon, koji uvijek djeluje normalno (okomito) na posmatranu površinu i 2) tangencijalni napon koji djeluje paralelno na pritisnu površinu. Normalni naponi mogu biti zatezni ili pritisni. Ostali naponi su ili slični ovim ^{osnovnim} naponima ili su kombinovani od njih. Na primjer naponi u savijenoj gredi, općenito se ^{odnose} kao "savijajući naponi", su ^{u stvari} zapravo kombinacija zateznih, pritisnih i smičućih napona. Uvojni napon koji se javlja kod okretnog vratila je tangencijalni napon.

- Kada vanjske sile djeluju na ^{element} član paralelno sa njegovom glavnom osom i element je konstantnog poprečnog presjeka, ili približno takav, rezultujući unutrašnji naponi su također paralelni toj osi. Takve sile se zovu aksijalne sile, a naponi se ^{nazivaju} kao aksijalni naponi.

B) Translate into English

- 1) Ipsi, mi još uvijek govorimo o protoku toplote kao da je ona fluid.
 - Nevertheless, we still speak of the ^{flow} of heat as though it were a fluid.
- 2) Zatezna čvrstoća se definiše kao najveći jedinični napon koji materijal može podnijeti bez loma.
 - Ultimate stress ^{ili jačina} or strenght is defined as the greatest unit stress a material can withstand without rupture.
- 3) Krti materijali otkazuju iznenada bez upozorenja kada su napregnuti iznad njihove čvrstoće.
 - Brittle materials fail suddenly without warning when stressed beyond their strength.
- 4) Uobičajno je za disk kočnice da se ugrade na prednje točkove.
 - It is usual for the disc brakes to be fitted to the front wheels.
- 5) Kuglični i valjčani ležajevi su poznati kao antifrikcioni ležajevi i imaju određene prednosti nad radijalnim ležajima.
 - Ball and roller bearings are known as anti-friction bearings, and have certain advantages over journal bearings.

