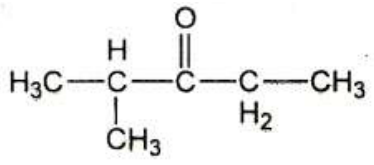
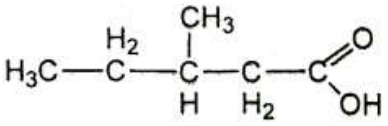
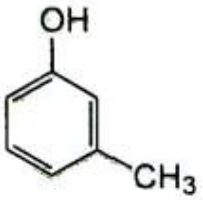
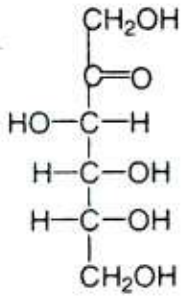
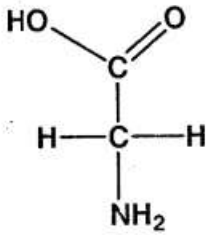
Bioorganic chemistry
Home work
Variant 1

1. Give the definition to the alcohols. Draw up the 3 structural formulas of different alcohols and name theirs. Indicate and name the functional group of the alcohols.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms: a) alkyl; b) covalent bonds.

4. Write structural formulas for: a) 3-ethyl-2-methylpentan-1-ol; b) 2,4,6-trichlorophenol; c) 3-oxobutanoic acid; d) 4-methylpyridine.

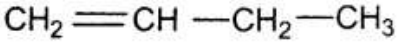
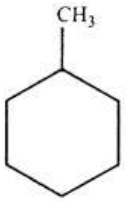
5. Write the equations for the following chemical reactions:
a) interaction of ethene with chlorine;
b) interaction of ethanol with sodium;
c) interaction 1 mole of the glycerol with 1 mole of the stearic acid and 2 moles of the oleic acid;
d) interaction 1 mole of the glycine with 1 mole of the alanine and 1 mole of the leucine;
e) interaction 1 mole of the propan-2-ol with 1 mole of the acetic acid;
f) interaction of the glucose with copper(II) hydroxide under heating.

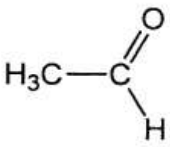
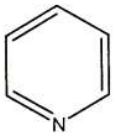
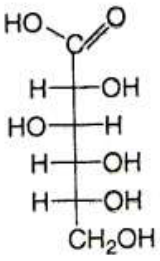
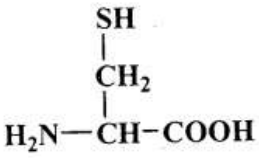
6. Monosaccharaides: definition, structure, classification, chemical properties (write equations of the chemical reactions which are typical for glucose).

Bioorganic chemistry
Home work
Variant 2

1 Give the definition to the aldehydes. Write the 3 structural formulas of different aldehydes and name theirs. Indicate and name the functional group of the aldehydes.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) nucleophiles; b) nucleotides.

4. Draw up structural formulas for: a) 2,3-dimethylpentane; b) 1 -chloro-2-methylbenzene;

c) 3-ethyl-2-methylpentan-l-ol; d) glyceryl tripalmitate.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Gly-Ser-Ala;

b) glucose + aqueous bromine;

c) Leucine + tryptophan ;

d) glyarol + palmitic acids + oleie acids + arachidonic acids

e) choline + HCl

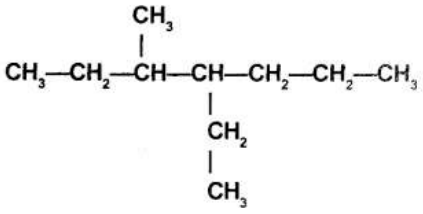
f) reduction of serite.

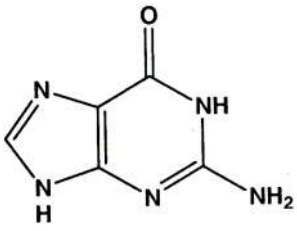
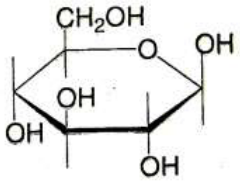
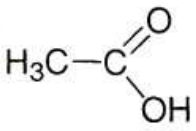
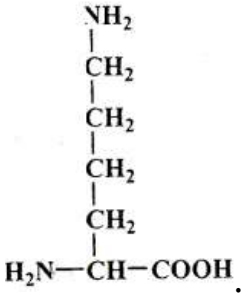
6. Amino acids: definition, structure, classification, chemical properties (draw up equations of the chemical reactions which are typical for glycine).

Bioorganic chemistry
Home work
Variant 3

1 Give the definition to the ketones. Write the 3 structural formulas of different ketones and name theirs. Indicate and name the functional group of the ketones.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) electrophiles; b) nucleosides.

4. Draw up structural formulas for: a) 2,2-dimethylpropane; b) 2-ethyl-l,4-dimethyl benzene; c) propane-1,2-diol; d) glyceryl lauropalmitostearate

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Ala-Val-Ser;

b) reduction of fructose;

c) Lysine + tyrosine;

d) glucerol + stearic acid + palmitoleic acid + linoleic acid;

e) malic acid + sodium hydroxide;

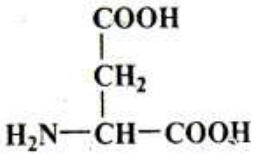
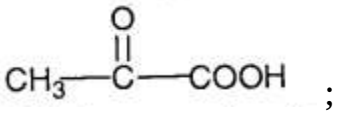
f) decarboxylation of valine.

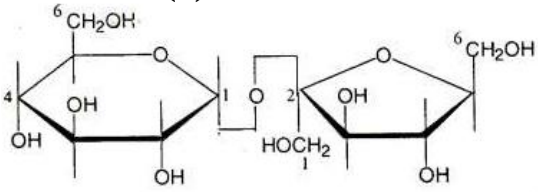
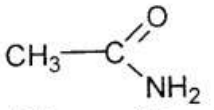
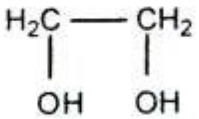
6. Hydroxy acids: definition, structure, examples, chemical properties (draw up equations of the chemical reactions which are typical for lactic acid).

Bioorganic chemistry
Home work
Variant 4

1 Give the definition to the carboxylic acids. Write the 3 structural formulas of different carboxylic acids and name theirs. Indicate and name the functional group of the carboxylic acids.

2. Name each of the following compounds and name theirs class:

a)  ; (b)  ; c)  ;

d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) reactions mechanism; b) nucleic acids.

4. Draw up structural formulas for: a) 4-ethyl-3-methylheptane; b) 1,3-dimethylbenzene; c) diethyl ether; d) glyceryl trioleoate.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Ser – Leu - Ala;

b) oxidation of glucose;

c) glucine + histidine;

d) arachidic acid + palmitic acid + oleic acid + glycerol;

e) salicyclic acid + methanol;

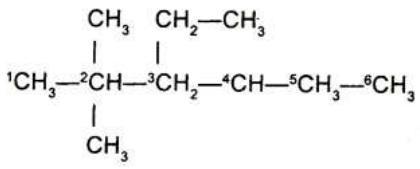
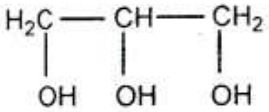
f) leucine + sodium.

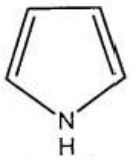
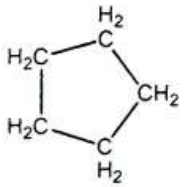
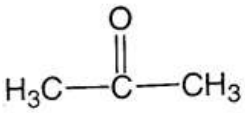
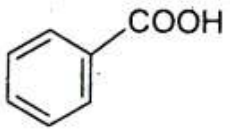
6. Keto acids: definition, structure, examples, chemical properties (draw up equations of the chemical reactions which are typical for pyruvic acid).

Bioorganic chemistry
Home work
Variant 5

1 Give the definition to the amino acids. Write the 3 structural formulas of different amino acids and name theirs. Indicate and name the functional groups of the amino acids.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) bond fission; b) isomer

4. Draw up structural formulas for: a) 2-methyl-but-2-ene; b) ethenylbenzene; c) methyl acetate; d) 1-oleyl-2,3-dilinoleylglycerol

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Cys – Ser – Gly;

b) D-glucose + Fehling's reagent $\xrightarrow{\text{heat}}$;

c) alanine + tryptophan;

d) glycerol + oleic acid + linoleic acid + palmitic acid;

e) salicyclic acid + sodium carbonate;

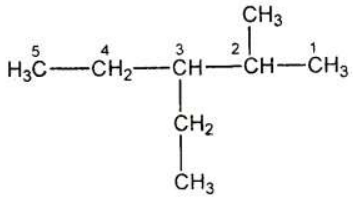
f) tartar acid + potassium hydroxide.

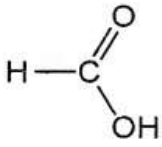
6. Amino alcohols: definition, structure, examples, chemical properties (draw up equations of the chemical reactions which are typical for colamine).

Bioorganic chemistry
Home work
Variant 6

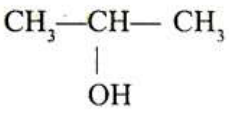
1 Give the definition to the hydroxy acids. Write the 3 structural formulas of different hydroxy acids and name theirs. Indicate and name the functional groups of the hydroxy acids.

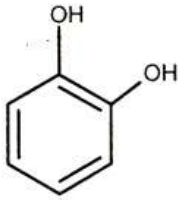
2. Name each of the following compounds and name theirs class:

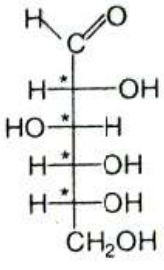
a) 

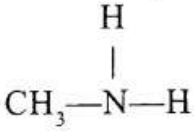
; b) 

;

c) 

; d) 

; e) 

; f) 

.

3. Give the definition to the following terms:

a) heterolytic fission; b) hydrocarbons.

4. Draw up structural formulas for: a) 2-methylpent-4-ene; b) dimethyl propyl amine;

c) acetic aldehyde; d) ethane-1,2,3 – triol.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Leu – Ala – Gly;

b) glucose + $LiAlH_4$ $\rightarrow$;

c) histidine + serine;

d) glycerol + arachidonic acid + oleic acid + palmitic acid;

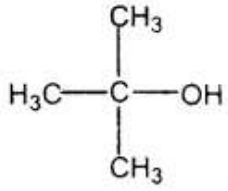
e,f) alanine + ethanol $\rightarrow ?$ $\xrightarrow{+NH_3}$.

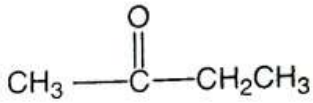
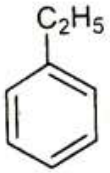
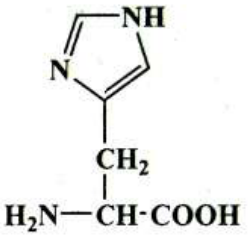
6. Five membered heterocycles compounds containing the single heteroatom: examples, the role in the living organisms and in medicine.

Bioorganic chemistry
Home work
Variant 7

1 Give the definition to the keto acids. Write the 3 structural formulas of different keto acids and name theirs. Indicate and name the functional groups of the keto acids.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) hemolytic fission; b) halogenoalkanes.

4. Draw up structural formulas for: a) 2-bromo-2-methylbutane; b) propan-2-amine;

c) methyl ethyl ether; d) dodecanoic acid.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Gly – Ala – Ser;

b) glucose + methanol $\xrightarrow{HCl\,gas}$;

c) tryptophan + valine;

d) glycerol + oleic acid + stearic acid + palmitic acid;

e) Colamine + acetic acid;

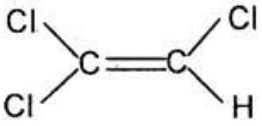
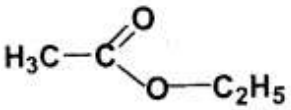
f) glycine + ethanol.

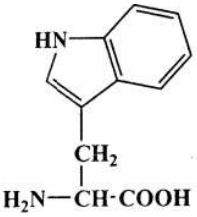
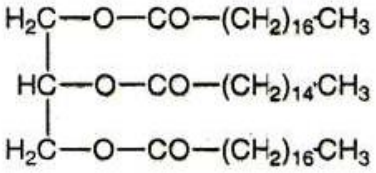
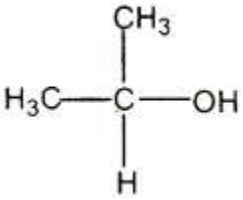
6. Five membered heterocycles compounds containing two heteroatoms: examples, the role in the living organisms and in medicine.

Bioorganic chemistry
Home work
Variant 8

1 Give the definition to the heterocycles. Write the 6 structural formulas of different heterocycles and name theirs.

2. Name each of the following compounds and name theirs class:

a)  ; b) CH_3CH_2CHO ; c)  ;

d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) free radicals; b) Fischer projection.

4. Draw up structural formulas for: a) ethyl chloride; b) 2-aminopropanoic acid ;

c) propanal ; d) tetradecanoic acid.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Val – Ser – Cys;

b) glucose + iodomethane $\xrightarrow{[OH^-]}$;

c) Threonine + glycine;

d) glycerol + linolenic acid + oleic acid + arachidic acid;

e) reduttion of valine;

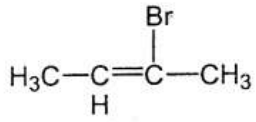
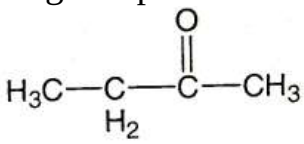
f) salicyclic acid + $(CH_3CO)_2O$.

6. Six membered heterocycles compounds containing the single heteroatom: examples, the role in the living organisms and in medicine.

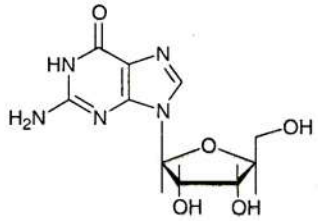
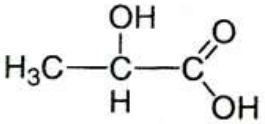
Bioorganic chemistry
Home work
Variant 9

1 Give the definition to the monosaccarides. Write the 3 structural formulas of different monosaccarides and name theirs. Indicate and name the functional groups of the monosaccarides.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c) $CH_3(CH_2)_4\mathbf{CH{=}CH}CH_2\mathbf{CH{=}CH}(CH_2)_7COOH$;

d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) radical reactions; b) ethers.

4. Draw up structural formulas for: a) 1,1,2-trichloroethylene; b) 3-oxobutanoic acid;

c) methyl ethanoate; d) hexadecanoic acid.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Cly – Ser – Ala;

b) glucose + $(CH_3CO)_2O$ →;

c) Leucine + lysine;

d) glycerol + linolenic acid + linoleic acid + palmitoleic acid;

e) lactic acid + sodium hydroxide;

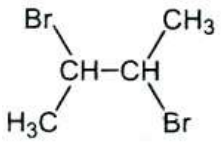
f) histidine + sodium.

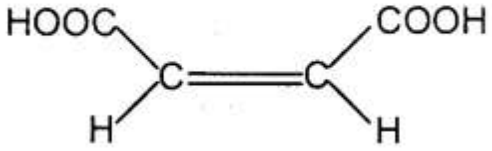
6. Six membered heterocycles compounds containing two heteroatoms: examples, the role in the living organisms and in medicine.

Bioorganic chemistry
Home work
Variant 10

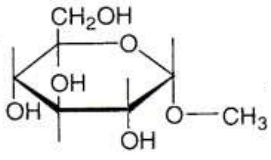
1 Give the definition to the lipids. Write the 4 structural formulas of different lipids and name theirs.

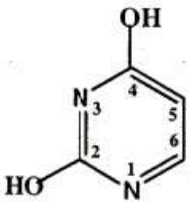
2. Name each of the following compounds and name theirs class:

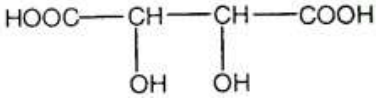
a) 

; b) 

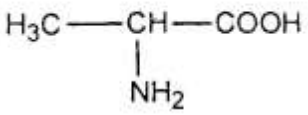
;

c) 

; d) 

; e) 

;

f) 

.

3. Give the definition to the following terms:

a) addition reactions; b) esters.

4. Draw up structural formulas for: a) 2-bromo-2-chloro-1,1,1 -trifluoroethane; b) 4-methylpyridine; c) 3-methylhexanoic acid; d) octadecanoic acid.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Ser – Leu – Ala;

b) glucose + fructose;

c) cysteine + glycine ;

d) glycerol + arachidic acid + arachidonic acid + oleic acid;

e) reduction of pyruvic acid;

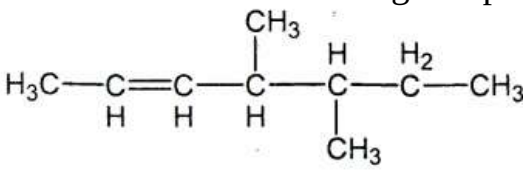
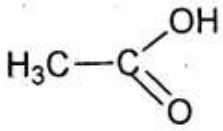
f) alanine + methanol.

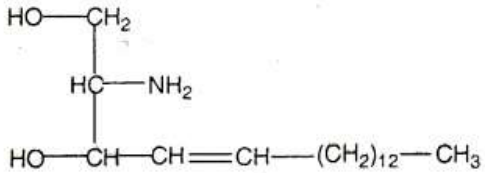
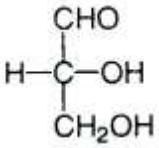
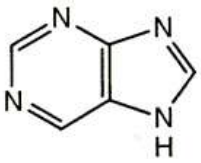
6. Disaccharides: structure, properties and biomedical application.

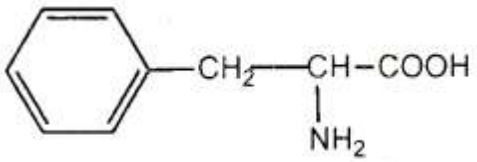
Bioorganic chemistry
Home work
Variant 11

1 Give the definition to the nucleosides. Write the 3 structural formulas of different nucleosides and name theirs.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ;

f)  .

3. Give the definition to the following terms:

a) sabstitution reactions; b) cholesterol.

4. Draw up structural formulas for: a) 3,3-chloro-2-methyl-hex-2-ol; b) 1,2-dimethylbenzene; c) 2,4,6-trichlorophenol; d) eicosanoic acid.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Ala – Val – Ser;

b) reduction of glucose;

c) arginine + serine;

d) glycerol + palmitic acid + oleic acid + stearic acid;

e) decarboxylation of alanine;

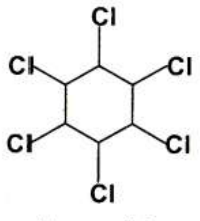
f) oxidation of lactic acid.

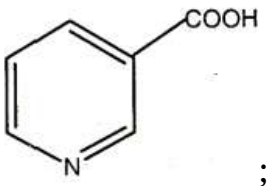
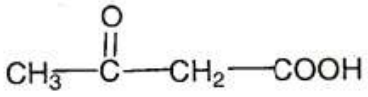
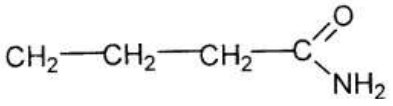
6. Triacylglycerols: definition, structure, chemical properties, medical application.

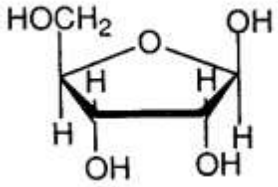
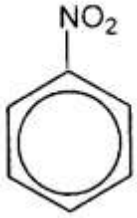
Bioorganic chemistry
Home work
Variant 12

1 Give the definition to the carbocyclic compounds. Write the 6 structural formulas of different carbocyclic compounds and name theirs.

2. Name each of the following compounds and name theirs class:

a)  ; b) $CH_3(CH_2)_5\mathbf{CH=CH}(CH_2)_7COOH$;

c)  ; d)  ; e) 

 ; f)  .

3. Give the definition to the following terms:

a) elimination reactions; chiral carbon atom.

4. Draw up structural formulas for: a) 2-bromo-pent-3-al; b) phenylmethanamine (benzylamine) ; c) 3-methylhexanoic acid; d) 1-palmitoyl-2-oleyl-phosphatidyl choline

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Cys – Ser – Cly;

b) D – glycose + Tollen's reagent $\xrightarrow{heat}$;

c) alanine + valine;

d) glycerol + linoleic acid + linolenic acid + stearic acid;

e) 2 – hydroxypropanoic acid + sodium;

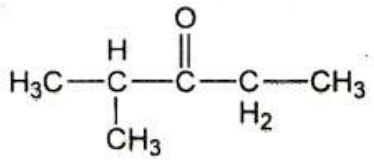
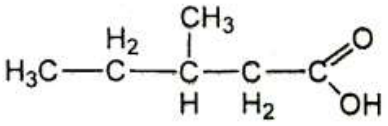
f) glycine + nitrous acid →.

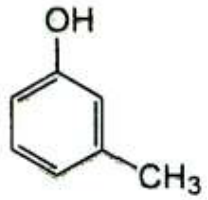
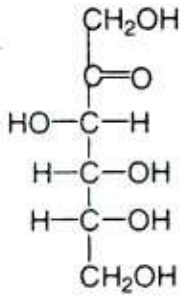
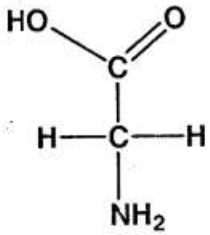
6. Proteins. Levels of structure in protein architecture.

Bioorganic chemistry
Home work
Variant 13

1. Give the definition to the alcohols. Draw up the 3 structural formulas of different alcohols and name theirs. Indicate and name the functional group of the alcohols.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms: a) alkyl; b) covalent bonds.

4. Write structural formulas for: a) 3-ethyl-2-methylpentan-1-ol; b) 2,4,6-trichlorophenol; c) 3-oxobutanoic acid; d) 4-methylpyridine.

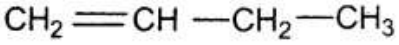
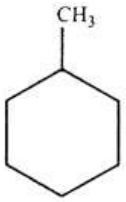
5. Write the equations for the following chemical reactions:
a) interaction of ethene with chlorine;
b) interaction of ethanol with sodium;
c) interaction 1 mole of the glycerol with 1 mole of the stearic acid and 2 moles of the oleic acid;
d) interaction 1 mole of the glycine with 1 mole of the alanine and 1 mole of the leucine;
e) interaction 1 mole of the propan-2-ol with 1 mole of the acetic acid;
f) interaction of the glucose with copper(II) hydroxide under heating.

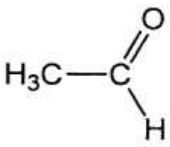
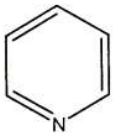
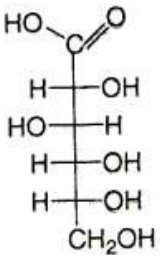
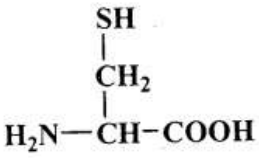
6. Monosaccharaides: definition, structure, classification, chemical properties (write equations of the chemical reactions which are typical for glucose).

Bioorganic chemistry
Home work
Variant 14

1 Give the definition to the aldehydes. Write the 3 structural formulas of different aldehydes and name theirs. Indicate and name the functional group of the aldehydes.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) nucleophiles; b) nucleotides.

4. Draw up structural formulas for: a) 2,3-dimethylpentane; b) 1 -chloro-2-methylbenzene;

c) 3-ethyl-2-methylpentan-l-ol; d) glyceryl tripalmitate.

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Gly-Ser-Ala;

b) glucose + aqueous bromine;

c) Leucine + tryptophan ;

d) glyarol + palmitic acids + oleie acids + arachidonic acids

e) choline + HCl

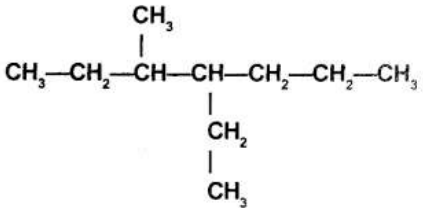
f) reduction of serite.

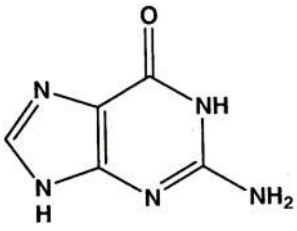
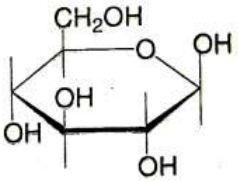
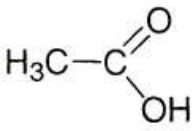
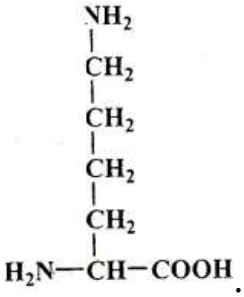
6. Amino acids: definition, structure, classification, chemical properties (draw up equations of the chemical reactions which are typical for glycine).

Bioorganic chemistry
Home work
Variant 15

1 Give the definition to the ketones. Write the 3 structural formulas of different ketones and name theirs. Indicate and name the functional group of the ketones.

2. Name each of the following compounds and name theirs class:

a)  ; b)  ;

c)  ; d)  ; e)  ; f)  .

3. Give the definition to the following terms:

a) electrophiles; b) nucleosides.

4. Draw up structural formulas for: a) 2,2-dimethylpropane; b) 2-ethyl-l,4-dimethyl benzene; c) propane-1,2-diol; d) glyceryl lauropalmitostearate

5. Write the equations for the following chemical reactions:

a) the digestion (hydrolysis) of Ala-Val-Ser;

b) reduction of fructose;

c) Lysine + tyrosine;

d) glucerol + stearic acid + palmitoleic acid + linoleic acid;

e) malic acid + sodium hydroxide;

f) decarboxylation of valine.

6. Hydroxy acids: definition, structure, examples, chemical properties (draw up equations of the chemical reactions which are typical for lactic acid).