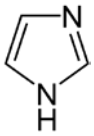
Structural Biochemistry exam subject for the students of the Faculty of Dentistry (winter session, 2018-2019):

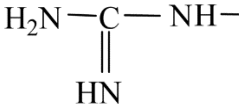
1. Choose from the list the non-metal macroelements:
2 Choose from the list the non-metal macroelements:
3 In which molecules hydrogen bonds can form?
4 Select from listed microelements the metals:
5 Select from listed microelements the non-metals:
6 Select from the list the essential microelements:
7 Select the biomacromolecules:
8 Select the biomacromolecules:
9 Select the biomolecules which contain the functional group –COOH:
10 Select the micromolecules:
11 Select the micromolecules:
12 Select which statements are correct for the chemical compound: $H_2N\text{-}CH_2\text{-}CH_2\text{-}OH$
13 Which amino acid contains sulphur?
14 Which biomolecules contain sulphur?
15 Which biomolecules contain the functional group $-NH_2$?
16 Which biomolecules contains phosphorus?
17 Which elements from listed are microelements?
18 Which functional groups are present in asparagine?
19 Which functional groups are present in cysteine?
20 Which functional groups are present in lactic acid?
21 Which functional groups are present in pyruvic acid?
22 Which functional groups are present in threonine?
23 Which is the class of chemical compounds acetone belongs to?
24 Which is the class of chemical compounds glycerol belongs to?
25 Which is the most important organogenic element?
26 Which is the name of the fuctional group
27 Which is the name of the functional group
28 Which is the name of the functional group  ?
29 Which is the name of the functional group –COOH?
30 Which is the name of the functional group $-NH_2$?
31 Which is the name of the functional group –OH?
32 Which is the name of the functional group –SH?
33 Which listed bioelement is organogenic?
34 Which listed bioelements are minerals?
35 Which listed macroelement is a metal?
36 Which listed macroelement is a non-metal?
37 Which listed macroelements are metals?
38 Which listed molecules contain polar covalent bond?
39 Which statement referring to nitrogen is correct?
40 Which statements are correct for ionic bond?
41 Which statements are correct for van-der-Waals forces?
42 Which statements for hydrogen bond are correct?
43 Which statements referring to hydrogen are correct?
44 Which substance occur in gastric juice?
45 Which vitamins contain sulphur?

46 Select the acidic amino acid:

49 Select the amino acid that contains imidazol group:



50 Select the amino acid that contains the guanidino functional group:



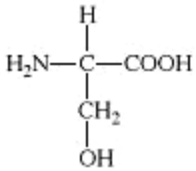
51 Select the amino acid that contains the hydroxyl functional group:

52 Select the amino acid that contains the indol functional group:

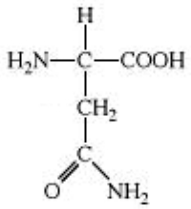
53 Select the basic amino acids:

54 Select the biopolymer:

55 Select the correct statement about the chemical compound:



56 Select the correct statement about the chemical compound:



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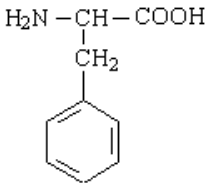
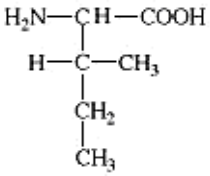
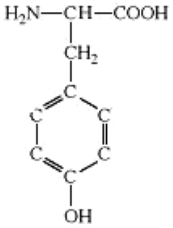


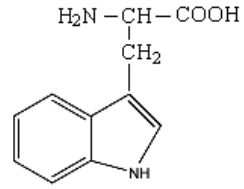
58 Select the correct statement about the chemical compound:



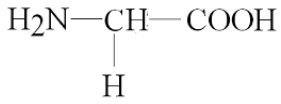
59 Select the correct statement about the chemical compound:



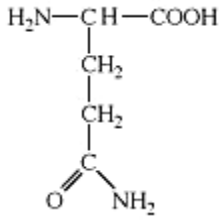
60 Select the correct statements about the chemical compound:



61 Select the correct statements about the chemical compound:



62 Select the correct statements about the chemical compound:



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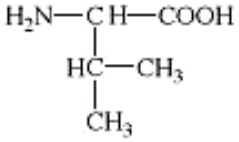
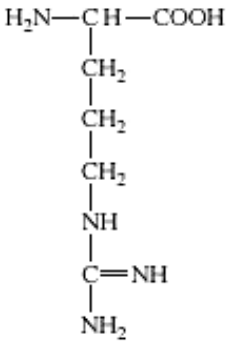
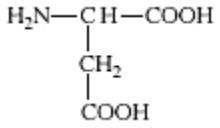


64 Select the correct statements about the chemical compound:



65 Select the correct statements about the chemical compound:



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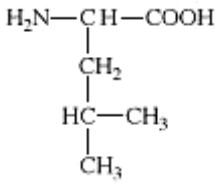

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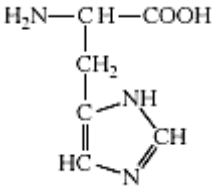

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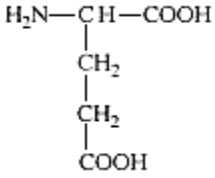
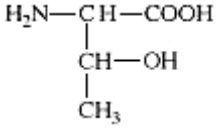
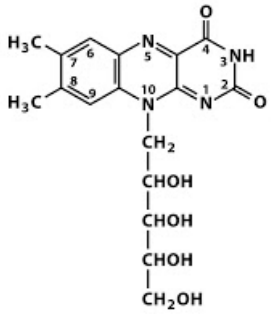


69 Select the correct statements about the chemical compound:

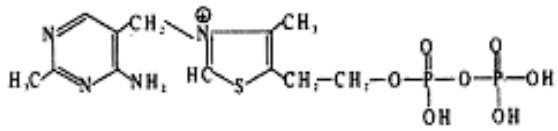


70 Select the correct statements about the tripeptide Asp-Leu-Glu (learn the structure):
71 Select the correct statements about the tripeptide Lys-Arg-His (learn the structure):
72 Select the correct statements about the tripeptide Ile-Asn-Glu (learn the structure):
73 Select the cyclic amino acid:
75 Select the essential amino acid:
76 Select the hydrophobic non-polar amino acids:
77 Select the hydroxy amino acid:
78 Select the imino acid:
79 Select the monoaminodicarboxylic amino acid:
80 Select the neutral amino acid:
81 Select the non-essential amino acid:
82 What compound is the structural unit of simple proteins?
83 What compounds contain nitrogen?
84 What type of amino acids is present in proteins?
85 Which amino acid has the isoelectric point in basic media?
86 Which amino acid has the isoelectric point in basic media?
87 Which compounds contain free amino group (-NH_2)?
88 Which compounds contain free carboxylic groups (-COOH)?
89 Classification of proteins - select the correct statement:
90 Globulins - select the correct statement:
91 Histones- select the correct statements:
92 Peptide bond has the following properties:
93 Protein functions are:
94 Select the correct statement about the tertiary structure of proteins:
95 Select the correct statements about hemoglobin (Hb):
96 Select the correct statements about the primary structure of proteins:
97 Select the correct statements about the secondary structure of protein - β-structure:
98 Select the correct statements about the secondary structure of protein - α-helix:
99 Select the correct statements regarding albumins:
100 Select the correct statements:
101 Select the oligomers:
102 The primary structure of proteins - select the correct statement:

103 The quaternary structure of proteins - select the correct statements:
104 The secondary structure of proteins - select the correct statement:
105 The tertiary structure of proteins - select the correct statements:
106 Which of the following compounds are calcium-binding proteins?
107 Conditions for protein precipitation are:
108 Determine the isoelectric point (pI) of the following tripeptide:
Arg-Lys-His; Asp-Leu-Glu; Ala-Gli-Phe; Asn-Tyr-Gln; Ser-Cis-Met (learn their structure)
110 Isoelectric point (pI) - select the correct statement:
111 Protein colloidal solutions have the following properties:
112 Protein salting-out is:
113 Protein solubility - select the correct statement:
114 Stability of the protein in a solution is determined by:
115 The total charge of a protein depends on:
116 What functional groups of proteins have acidic properties?
117 What functional groups of proteins have basic properties?
118 What happens during the denaturation of protein molecule?
119 NAD^+ coenzyme - select the correct statements:
120 $NADP^+$ coenzyme - select the correct statement:
121 $NADP^+$ coenzyme - select the correct statement:
122 Select the chemical process in which is involved vitamin C:
123 Select the correct statements about coenzymes - derivatives of vitamin B2:
124 Select the correct statements about coenzymes FAD and FMN:
125 Select the correct statements about the chemical compound:



126 Select the correct statements about the chemical compound:



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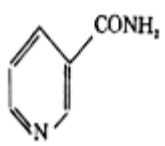
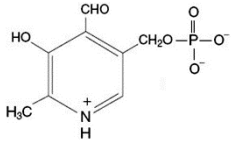
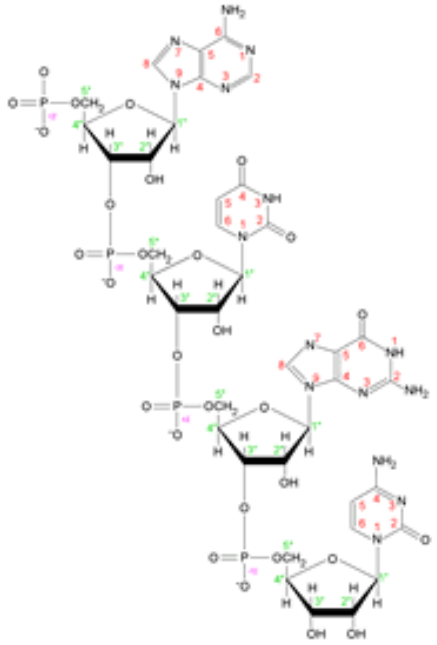


128 Select the correct statements about the chemical structure:

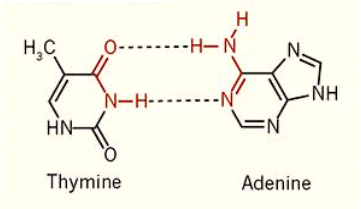


129 Select the correct statements about the cofactors:

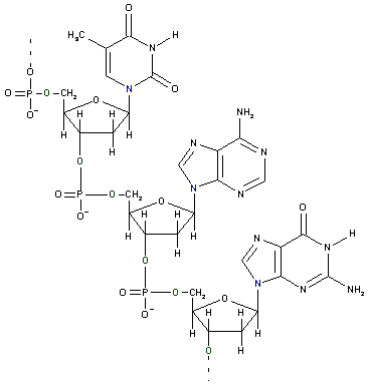
130 Select the chemical process that involves vitamin C:
131 Choose the correct statement about nucleosome:
132 Choose the correct statement about rRNA:
133 Choose the correct statement about tRNA:
134 Choose the correct statements about DNA nucleotide composition - complementarity laws:
135 Choose the correct statements about mRNA:
136 Choose the correct statements about RNA:
137 Choose the correct statements about the secondary structure of DNA:
138 Choose the correct statements about the secondary structure of DNA:
139 Choose the correct statements about the structure shown in the picture:



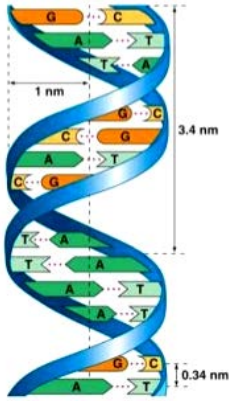
140 Choose the correct statements about the structure shown in the picture:



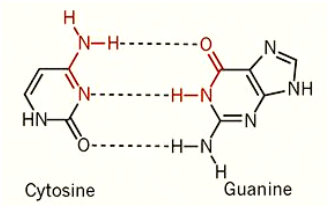
141 Choose the correct statements about the structure shown in the picture:



143 Choose the correct statements about the structure shown in the picture:



145 Choose the correct statements about the structure shown in the picture:

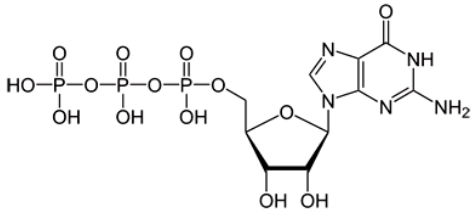


147 Choose the type of chemical bond that **<u>is not</u>** present in nucleic acids:

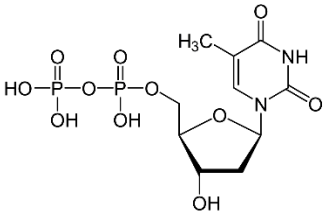
148 Histones - select the correct statements:

149 Select the correct statement about DNA structure:

150 Select the correct statement about the chemical structure:



151 Select the correct statement about the chemical structure:



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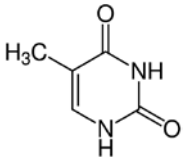

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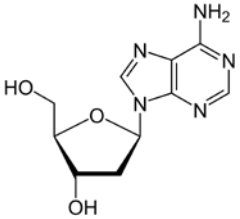

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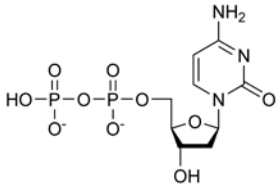

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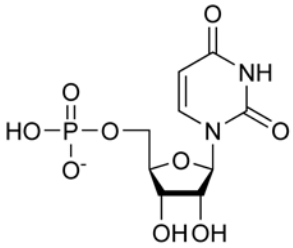

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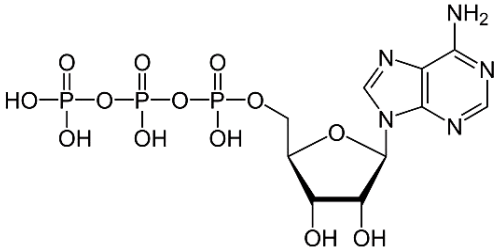

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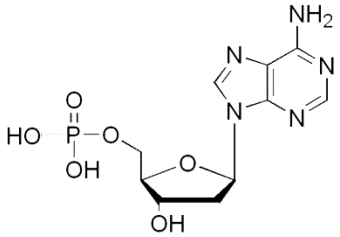

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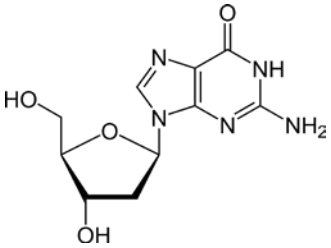

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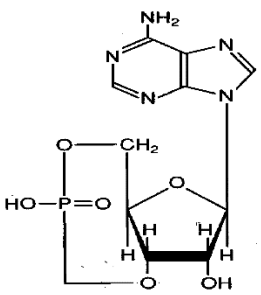

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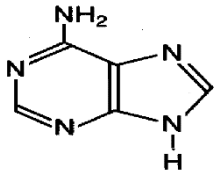

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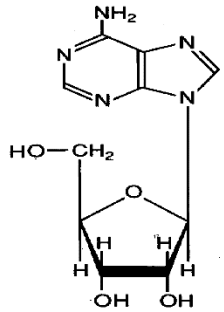

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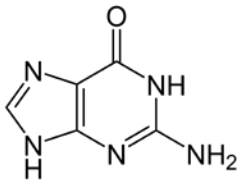

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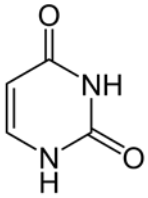

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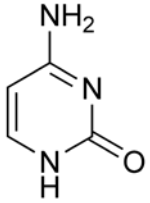

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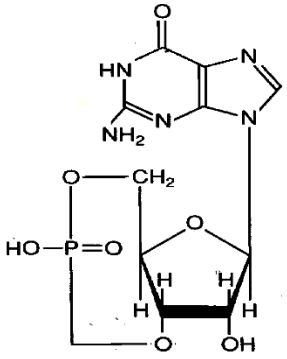

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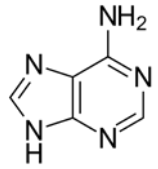

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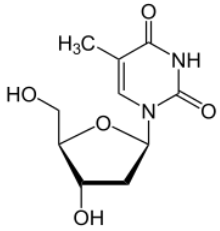


168 Structural components of DNA are:

169 Structural components of RNA are:

170 The major nitrogenous bases in DNA are:

171 The major nitrogenous bases in DNA are:

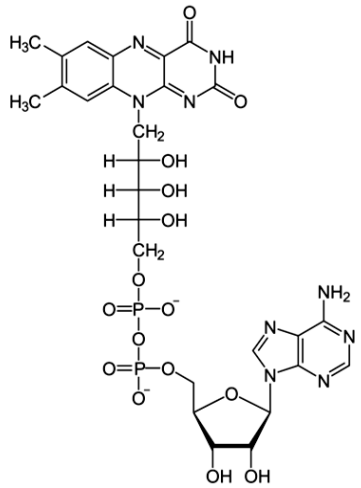
172 The major nitrogenous bases in RNA are:

173 The number of hydrogen bonds in the following double-stranded DNA sequence is:

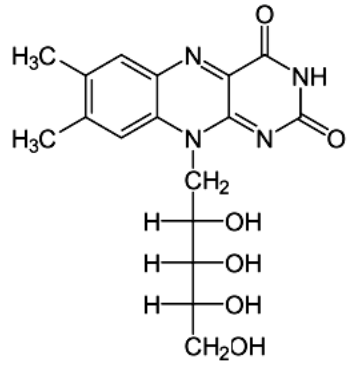
T - C - G - A - G - A
A - G - C - T - C - T

174 The secondary structure of DNA:

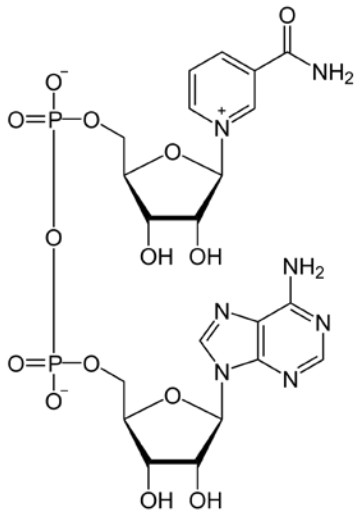
175 Select the correct statement about the chemical compound:



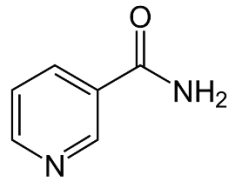
176 Select the correct statements about the chemical compound:



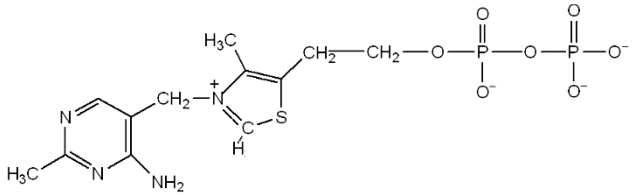
177 Select the correct statements about the chemical compound:



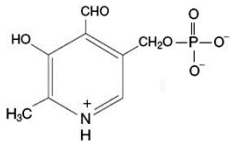
178 Select the correct statements about the chemical compound:



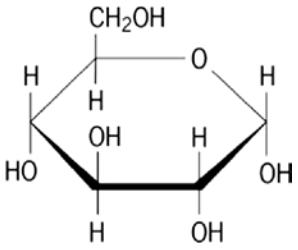
179 Select the correct statements about the chemical compound:



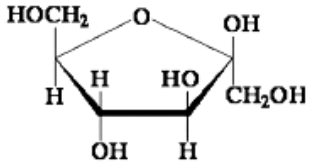
180 Select the correct statements about the chemical structure:



181 Which are the metabolic functions of vitamins?
182 Which are the possible causes of hypovitaminosis?
183 Carbohydrates of the biological membranes:
184 Chose the lipids that are components of the cell membranes:
185 Main properties of the membranes:
186 Main properties of the membranes:
187 Select the correct statements regarding the proteins of biological membranes:
188 The proteins of biological membranes:
189 The proteins of biological membranes:
190 Choose the carbohydrate that is present in the human body:
191 Choose the carbohydrate that is present in the human body:
192 Choose the carbohydrates that are specific for humans:
193 Choose the correct statement about disaccharidases - enzymes that hydrolyse the disaccharides:
194 Choose the correct statement about disaccharides:
195 Choose the correct statements about homopolysaccharides:
196 Choose the correct statements about the following compound:

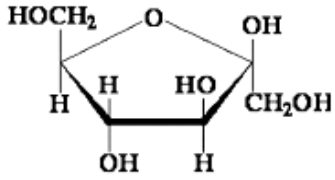


197 Choose the correct statements regarding the following compound:

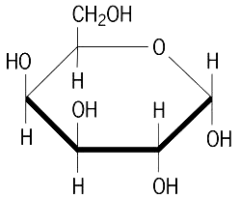


198 Choose the functions of carbohydrates:
199 Disaccharides - which statements are correct regarding their properties?
200 Fructose - select the correct statement:
201 Fructose - select the correct statement:
202 Glucose - select the correct statement:
203 Glycogen - select the correct statement:
204 Glycogen - select the correct statement:
205 Glycogen - select the correct statements:
206 Homopolysaccharides - select the correct statements:
207 Lactose - select the correct statement:
208 Lactose - select the correct statement:
209 Lactose - select the correct statement:
210 Maltose - select the correct statement:
211 Maltose - select the correct statement:
212 Maltose - select the correct statements:
213 Monosaccharides are:
214 Monosaccharides are:
215 Sucrose - select the correct statement:
216 Sucrose - select the correct statement:
217 Sucrose - select the correct statements:
218 The following 2 monosaccharides result in the digestion of sucrose:
219 The following statement about monosaccharides is true:
220 The following statements about monosaccharides are true:
221 The function of carbohydrates is:
222 The function of carbohydrates is:
223 What is the type of glycosidic bond contained in sucrose?
224 What kind of glycosidic bonds enter in the cellulose macromolecule?
225 Which compounds are obtained at acid hydrolysis of lactose?
226 Which compounds are obtained at acid hydrolysis of sucrose?
227 Which compounds are obtained at hydrolysis of lactose?
228 Which compounds are obtained at hydrolysis of lactose?
229 Which compounds are obtained at hydrolysis of sucrose?
230 Which disaccharide is obtained at acid hydrolysis of starch?
231 Which glycosidic bond is part of amylase macromolecule?
232 Which glycosidic bonds are characteristic for amylopectin macromolecule?
233 Which glycosidic bonds are found in amylopectin macromolecule?

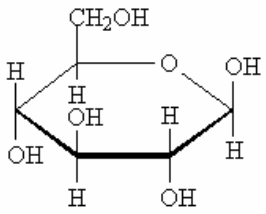
234 Which is the D-glucose active metabolic form?
235 Which is the disaccharide unit of amylose?
236 Which is the type of glycosidic bond in the macromolecule of glycogen that creates the branches?
237 Which is the type of the glycosidic bond that connects disaccharide fragments in the hyaluronic acid macromolecule?
238 Which is the type of the glycosidic bond that connects disaccharide fragments in the hyaluronic acid macromolecule?
239 Which monosaccharide at reduction forms the polyalcohol galactitol?
240 Which monosaccharide is the most spread in nature?
241 Which polysaccharide contains β-D-glucose?
242 Which polysaccharide fractions are part of starch granule?
243 Which substances are obtained at acid hydrolysis of sucrose?
244 Which types of glycosidic bonds are present in the macromolecule of glycogen?
245 Which oligo- or polysaccharide contains the represented compound?



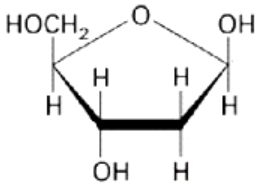
246 Which oligo- or polysaccharide contains the represented compound?



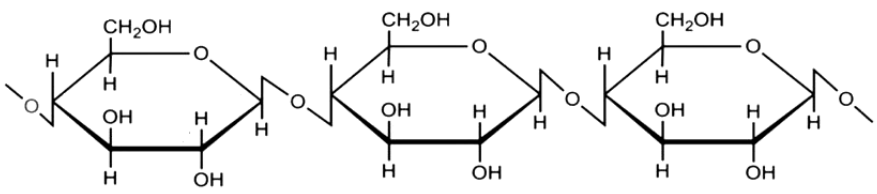
247 Which oligo- or polysaccharide contains the represented compound?



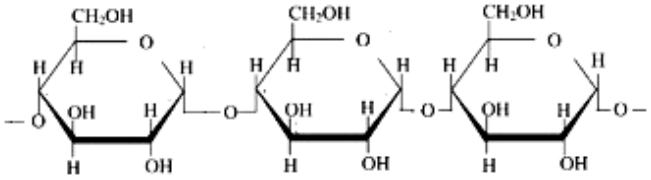
248 Which statement is correct for the following compound?



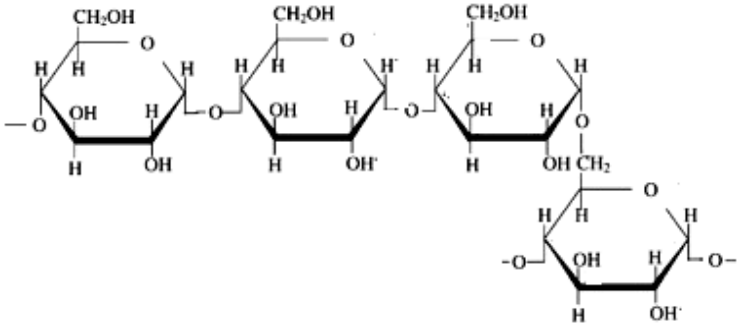
249 Which statement regarding the represented structure is correct?



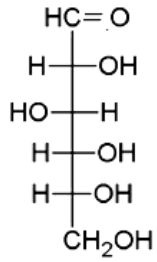
250 Which statement regarding the represented structure is correct?



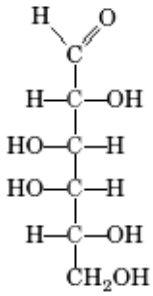
251 Which statement regarding the represented structure is correct?



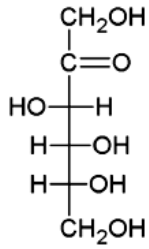
252 Which statements are correct for the following compound?



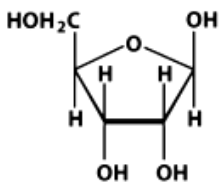
253 Which statements are correct for the following compound?



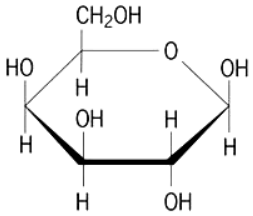
254 Which statements are correct for the following compound?



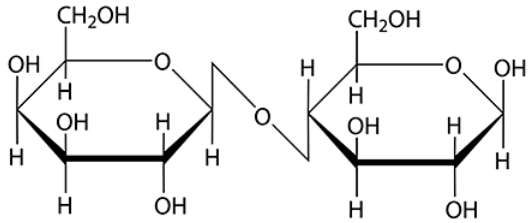
255 Which statements are correct for the following compound?



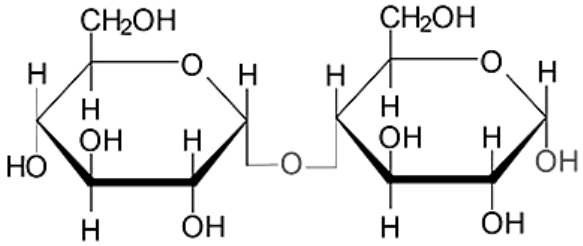
256 Which statements are correct for the following compound?



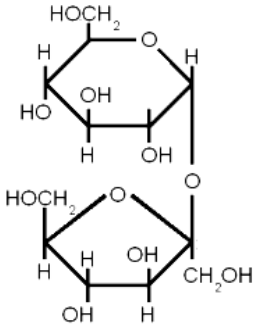
257 Which statements regarding the represented structure are correct?



258 Which statements regarding the represented structure are correct?

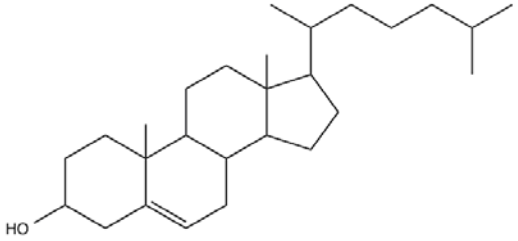


259 Which statements regarding the represented structure are correct?

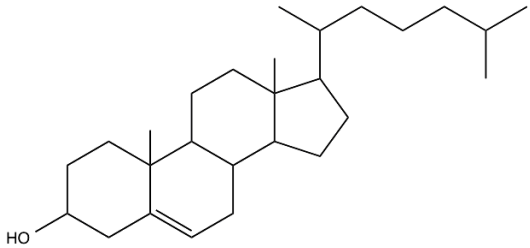


260 According to their biological role lipids are divided into the following classes:
261 According to their physico-chemical properties lipids are divided into the following classes:
262 Acylglycerols - select the correct statements:
263 Bile acids - select the correct statements:
264 Carbohydrates of the biological membranes:
265 Cerebrosides - select correct statements regarding their structure:
266 Functions of lipids are:
267 Gangliosides - select the correct statements:
268 Glycerophospholipids - choose the correct statements:
269 Glycolipids:
270 In human cells and tissues the following fatty acids prevail:
271 Lipid components of the cell membranes are:
272 Lipids are essential components of the diet, because:
273 Lipids are:
274 Main properties of the biologic membranes are:
275 Phosphatidylcholine and phosphatidylethanolamine - choose the correct answers:

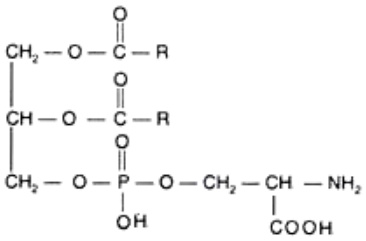
276 Phosphatidylcholines - select the correct statements:
277 Phosphatidylcholines and phosphtidylethanolamines - select the correct statements:
278 Phosphatidylethanolamines - choose the correct answers:
279 Select the correct statement about the following compound:



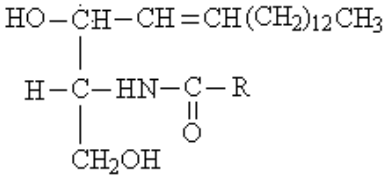
280 Sphingomyelines contain:
281 Sphingosine - select the correct answer:
282 Structural classification of lipids - select the specific classes:
283 The following fatty acids are essential for the humans:
284 Which compounds have an acidic functional group in their structure?
285 Which fatty acid has the lowest melting point?
286 Which fatty acid has the lowest melting point?
287 Select the chemical compounds whose precursor is the presented substance:



290 Which statement is correct regarding the compound?



291 Which statement is correct regarding the compound?



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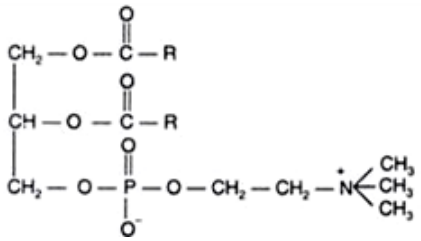
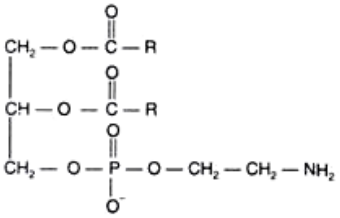
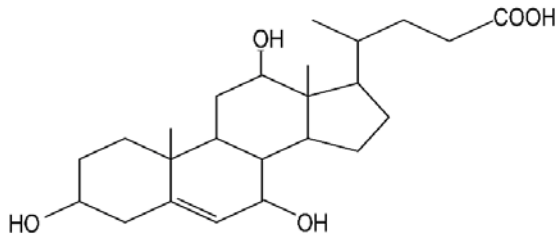


294 Which statement is correct regarding the compound?

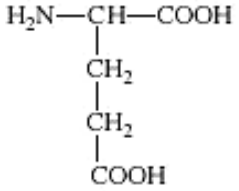


295 Which is the correct statement regarding the substance?

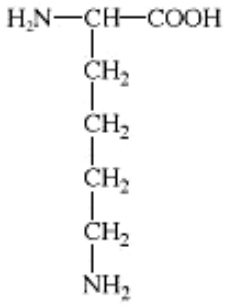


297 Select the chemical bonds that are formed between membrane proteins and lipids:
298 Select the correct affirmation about fat-soluble vitamins:
299 Select the correct affirmation about fat-soluble vitamins:
300 Select the correct affirmation about membrane properties:
301 Select the correct statement regarding the biological membrane proteins:
302 Select the correct statement regarding the membrane carbohydrates:
303 Select the correct statement regarding the membrane carbohydrates:
304 Select the substance which is transported via membranes by translocase (facilitated diffusion):
305 Select the substances which are transported via membranes by ATPase (primary active transport):
306 Select the substances which are transported via membranes by ATPase (primary active transport):
307 Select which substances below listed can pass through the cell membrane by simple diffusion:
308 Which statement is correct regarding vitamin A?
309 Which statement is correct regarding vitamin A?
310 Which substance is transported via membranes by sodium dependent transporters (secondary active transport)?
311 Which substance is transported via membranes by sodium dependent transporters (secondary active transport)?
312 Which vitamin is liposoluble?
313 Which vitamin is liposoluble?
314 Which vitamin is liposoluble?
315 Liposoluble vitamins - choose the correct statement:
316 Metabolism of vitamin D:
317 Select the correct statements about calcitriol:
318 Vitamin A - select the correct statement:
319 Vitamin D - select the correct statement:
320 Vitamin E - select the correct statements:
321 Vitamin K - select the correct statements:
322 Biological functions of proteins are:
323 Biological functions of proteins are:
324 Biological value of proteins is determined by the essential amino acids including the following one:
325 Biological value of proteins is determined by the essential amino acids including the following one:
326 Select the semi-essential amino acids from the following one:
327 Tissue usage of amino acids (AA):
328 Decarboxilation of amino acids:
329 Serotonin is synthesized from the following amino acid:

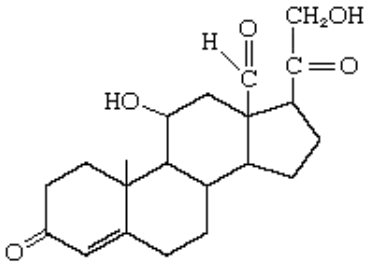
330 The precursor of catecholamines is:
331 The precursor of histamine is:
332 Phenylalanine (Phe) and tyrosine (Tyr) are precursors of:
333 Select correct statements about the following compound:



334 Select the correct statements concerning the following compound:



335 Tetrahydrofolic acid (TFH):
336 Tetrahydrofolic acid (THF) is the acceptor and donor of the following groups:
337 Hemoglobin (Hb) - which statements characterize its structure?
338 Hemoglobin is involved in the following processes:
339 Hemoproteins - select the correct statements:
340 Which proteins belong to the class of chromoproteins?
341 Cyclic AMP is:
342 Select the correct statements regarding the following hormone:



343 Select the sex hormones from the following one:
344 According to Arrhenius's electrolytic dissociation theory a base is:
345 According to Arrhenius's electrolytic dissociation theory an acid is:
346 Buffering capacity of plasma proteins is determined by the following amino acids:
347 Choose the correct relation for acid aqueous solutions:
348 Choose the correct relation for alkaline aqueous solutions:
349 Choose the correct relation for neutral aqueous solutions:
350 Choose the correct statements for buffer solution:
351 Choose the correct statements that characterize water:
352 Select buffer system that is present only in the erythrocytes:
353 Select buffer systems that are present both in the plasma and erythrocytes:
354 Select from the proposed list the physical properties that can characterize water:
355 Select the buffer system that is present only in blood plasma:

356 Select the correct statements for pH:
357 Serum albumin - select the correct statements regarding the compound:
358 Serum albumin - select the correct statements regarding the protein:
359 Serum albumin - select the correct statements:
360 The main blood buffer systems are:
361 What happens after adding a base (OH^-) to the acetate buffer (CH_3COOH/CH_3COONa)?
362 What happens after adding a base (OH^-) to the carbonate buffer ($H_2CO_3/NaHCO_3$)?
363 What happens after adding a base (OH^-) to the phosphate buffer (NaH_2PO_4/Na_2HPO_4)?
364 What happens after adding an acid (H^+) to the acetate buffer (CH_3COOH/CH_3COONa)?
365 What happens after adding an acid (H^+) to the carbonate buffer $H_2CO_3/NaHCO_3$?
366 What happens after adding an acid (H^+) to the phosphate buffer (NaH_2PO_4/Na_2HPO_4)?
367 What is the characteristic pH range of the blood?
368 What is the composition of intracellular buffer systems?
369 What is the composition of the extracellular plasma buffer s system?
370 What values of pH listed correspond to acid environment?
371 What values of pH listed correspond to alkaline environment?
372 Which from listed is fundamental buffer systems Henderson-Hasselbach equation?
373 Which functional group in water creates acid pH?
374 Which functional group in water creates base pH?
375 Which particles from the listed have acid properties in aqueous solution according to the Bronsted-Lowry theory?
376 Which particles from the listed have base properties in aqueous solution according to the Bronsted-Lowry theory?
377 Heparin - select the correct statement regarding the compound: