

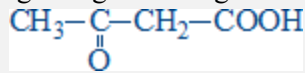
BIOCHEMISTRY EXAM ITEMS

for the students of the Faculty of Stomatology

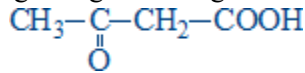
(3rd semester, winter session, 2023-2024):

1. Choose the correct statement about mRNA:
2. Choose the correct statement about rRNA:
3. Choose the correct statement about tRNA:
4. Choose the correct statements about RNA:
5. Structural components of DNA are:
6. Structural components of RNA are:
7. The major nitrogenous bases in DNA are:
8. The major nitrogenous bases in DNA are:
9. The major nitrogenous bases in RNA are:
10. A common feature of the DNA and RNA biosynthesis is:
11. Choose the correct statement about RNA biosynthesis - transcription:
12. Choose the correct statements about RNA biosynthesis - transcription:
13. DNA replication - select the correct statement:
14. DNA-polymerases I:
15. DNA-polymerases III select the correct statements:
16. Okazaki fragments - select the correct statement:
17. RNA polymerases - select the correct statements:
18. RNA-dependent DNA polymerase - select the correct statements:
19. Select the compound that is required for DNA biosynthesis:
20. Select the correct statements about replication:
21. Select the enzymes of the DNA-replicase complex:
22. Select the enzymes of the DNA-replicase complex:
23. Select the posttranscriptional modification of mRNA:
24. Select the posttranscriptional modifications of tRNA:
25. Select the enzymes that are required for DNA repair:
26. Activation of amino acids in the translation process - select the correct statement:
27. Choose the correct statement about the genetic code:
28. Choose the correct statement about the genetic code:
29. Choose the correct statements about aminoacyl-tRNA-synthetases:
30. Initiation of protein synthesis requires:
31. Select the components of the protein synthesis initiation complex in prokaryotes:
32. Select the compounds that are required for the elongation stage of the protein biosynthesis:
33. Select the events that occur in the elongation step of translation:
34. Telomerase - select the correct statements:
35. The structure and function of ribosomes - select the correct statements:
36. Which of the following processes are posttranslational modifications of the protein?
37. Which of the following processes are posttranslational modifications of proteins?
38. Which of the following processes are specific for the termination stage of protein biosynthesis?
39. Select the correct statements about ketone bodies:
40. Regarding the usage of ketone bodies in tissues, the following statements are correct:
41. Select the correct statements about ketone bodies:

42. Select the correct statements regarding following chemical compound:



43. Select the correct statements regarding following chemical compound:



44. Chylomicrons - choose the correct statements:

45. Chylomicrons:

46. VLDL:

47. VLDL:

48. Bile acids - select the correct statements:

49. Choose the correct statements about the action of lipolytic enzymes in the gastrointestinal tract:

50. Chylomicrons - select the correct statements:

51. Chylomicrons - select the correct statements:

52. Complete digestion of the triglycerides in the gastrointestinal tract requires:

53. Dietary fat digestion in adults:

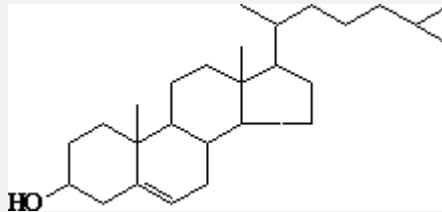
54. Functions of lipids are:

55. Hydrolysis of dietary lipids leads to formation of:

56. Lipids are essential components of the diet, because:

57. Select the correct statement about micelles:

58. Select the correct statement about the following compound:

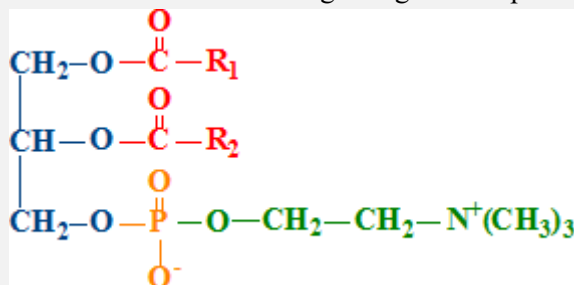


59. The following fatty acids are essential for the humans:

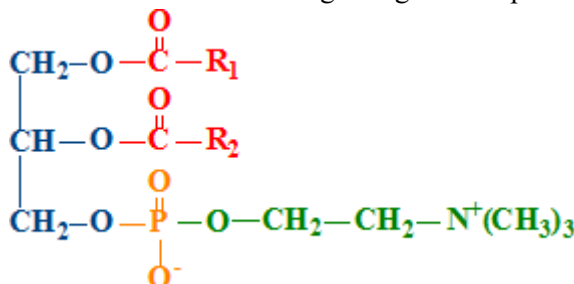
60. The mechanism of dietary lipids digestion products absorption in the gastrointestinal tract:

61. The products of lipid digestion absorbed in the intestine:

62. Which statement is correct regarding the compound?



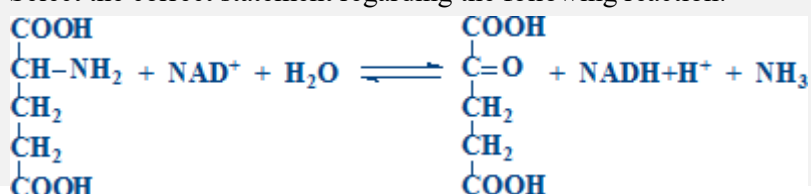
63. Which statement is correct regarding the compound?



64. The product of the second reaction of beta-oxidation of fatty acids is:

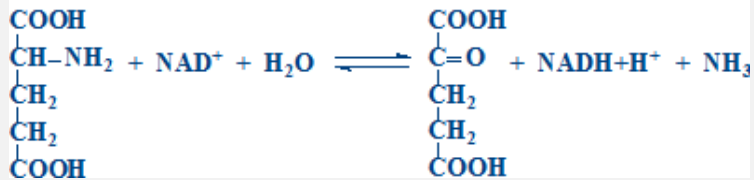
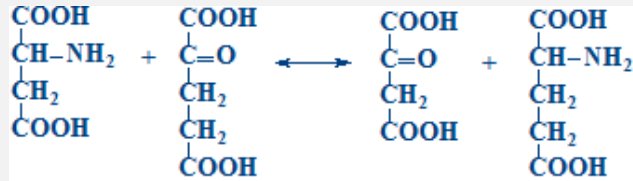
65. Activation of fatty acids (FA) (in beta-oxidation of fatty acids):
66. Activation of fatty acids (FA) during beta-oxidation of fatty acids - select the correct reaction:
67. Beta oxidation involves a sequence of four reactions. Choose their correct order:
68. Beta-oxidation of fatty acids (FA) - choose the correct statements:
69. Choose the correct statements about the ketone bodies:
70. How can be used acetyl-CoA?
71. How many turns are necessary (1), how many molecules of acetyl-CoA (2) and of ATP (3) are produced during the complete oxidation of stearic acid (C18):
72. In one turn of beta-oxidation the fatty acid undergoes the following changes:
73. Ketone bodies - select the chemical compounds that belong to them:
74. Ketonemia - select the correct statement:
75. Name the products of the third reaction of beta-oxidation and the enzyme that catalyzes it:
76. Select compounds that can be synthesized from beta-hydroxy-beta-methyl-glutaryl-CoA:
77. Select the 4th reaction of beta-oxidation and the enzyme that catalyzes it:
78. Select the correct statements about the utilization of ketone bodies in tissues:
79. The products of Acyl-CoA dehydrogenation reaction of beta-oxidation of fatty acids are:
80. The second reaction of beta-oxidation of fatty acids - select the correct statements:
81. The third reaction of beta-oxidation of fatty acids - select the correct statement:
82. Transformation of acyl-CoA in the first reaction of beta-oxidation of fatty acids:
83. Transport of fatty acids (FA) from cytoplasm into the mitochondrial matrix during beta-oxidation:
84. Acetyl-CoA transport from mitochondria into cytosol during fatty acid biosynthesis:
85. Activator (1) and inhibitor (2) of acetyl-CoA carboxylase - the regulating enzyme of fatty acids synthesis:
86. Biosynthesis of fatty acids - choose the correct statements:
87. Biosynthesis of malonyl-CoA during the fatty acid synthesis:
88. Choose the correct statements about fatty acid biosynthesis:
89. Differences between fatty acid oxidation and biosynthesis:
90. Enzyme (1) and reaction product (2) of the transformation of enoyl-ACP during the biosynthesis of fatty acids are:
91. NADPH is a donor of reducing equivalents (H⁺) in the synthesis of fatty acids. In what processes is NADPH obtained?
92. Reaction of beta-ketoacyl-ACP reduction during biosynthesis of fatty acids:
93. Reactions of the biosynthesis of fatty acids:
94. Synthesis of one molecule of palmitic acid requires:
95. The first cycle of the biosynthesis of saturated fatty acids with even number of carbon atoms:
96. The reaction of beta-ketoacyl-ACP synthesis during the biosynthesis of fatty acids:
97. What is characteristic of fatty acid synthase?
98. Which enzyme is involved in acetyl-CoA transport from mitochondria into cytosol during fatty acid biosynthesis:
99. Which is the substrate of fatty acids synthesis (1) and the compound that is transporting it from mitochondria into cytosol (2)?
100. Biosynthesis of cholesterol - select the correct statements:
101. Biosynthesis of triacylglycerols - select the correct statement:
102. Choose the correct statements about the synthesis of glycerophospholipids:
103. During the triacylglycerols biosynthesis the phosphatidic acid is:
104. Glycerol-3-phosphate is produced in the reaction of:
105. Name the source of methyl group in the synthesis of phosphatidylcholine:
106. Phosphatidylcholine can be synthesized by:
107. Phosphatidylethanolamine can be synthesized by:

108. Regulation of cholesterol biosynthesis:
109. Select the rate-limiting reaction of cholesterol synthesis:
110. The common intermediary compound of triglycerides and phosphoglycerides synthesis is:
111. Liposoluble vitamins - choose the correct statement:
112. Select the correct statements about calcitriol:
113. Vitamin A - select the correct statement:
114. Vitamin D - select the correct statement:
115. Vitamin E - select the correct statements:
116. Vitamin K - select the correct statements:
117. Absorption of amino acids (AA) - select the correct statement about the process:
118. Absorption of amino acids (AA) - select the correct statement about the process:
119. Aminopeptidases - select the correct statements:
120. Biological functions of proteins are:
121. Biological value of proteins is determined by the essential amino acids including the following one:
122. Biological value of proteins is determined by the essential amino acids including the following one:
123. Carboxypeptidases - select the correct statements:
124. Chymotrypsin - select the correct statements:
125. Equilibrated nitrogen balance - select the correct statements:
126. How are amino acids used in tissues?
127. Negative nitrogen balance - what statements characterize it?
128. Pepsin - select the correct statement regarding the enzyme:
129. Positive nitrogen balance - choose the correct statements:
130. Putrefaction of amino acids in the intestine - select the correct statements about the process:
131. Select the semi-essential amino acids from the following one:
132. Trypsin - select the correct statements:
133. What are the biological functions of proteins?
134. What are the functions of HCl in the digestion of proteins?
135. What are the HCl functions in the digestion of proteins?
136. What are the properties of pepsin?
137. Alanine aminotransferase (ALAT) - select the statements that characterize it:
138. Alanine transdeamination - select the correct statements:
139. Amino acid transamination (TA) - select the correct statements about the process:
140. Amino transferases - select the correct statements about the enzymes:
141. Aminotransferases - select the correct statement about the enzyme:
142. Aspartate aminotransferase (ASAT) - select the correct statements about the enzyme:
143. Choose the general pathways of amino acids catabolism:
144. Direct deamination (DA) of the amino acids - select the correct statements about the process:
145. Glutamate dehydrogenase - select the correct statement:
146. Indirect amino acid deamination (transdeamination) - select the correct statements about the process:
147. Select the class to which the enzyme glutamate dehydrogenase belongs
148. Select the correct statement regarding the following reaction:



149. Select the correct statements about the amino acids deamination (DA):

150. Select the correct statements about the following chemical reactions:



151. Select the correct statements regarding the following reaction:

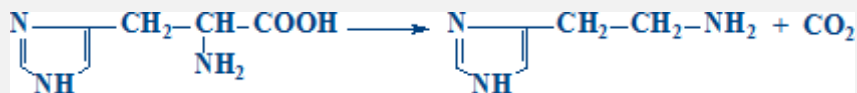
152. Transdeamination of aspartate. Select the reaction of the process (1) and the enzyme (2) that catalyzes the reaction:

153. Transamination of amino acids - select the correct statement:

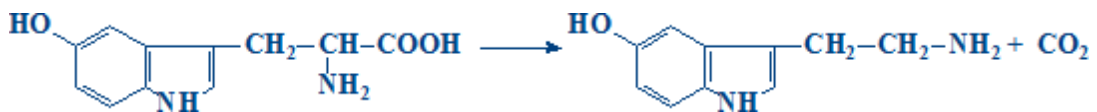
154. What are the general types of deamination of amino acid?

155. Decarboxilation of amino acids:

156. Select the correct statements about the following chemical reaction:



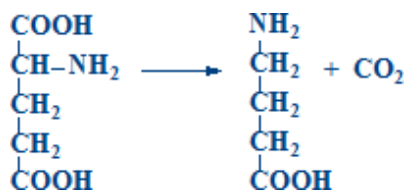
157. Select the correct statements about the following chemical reaction:



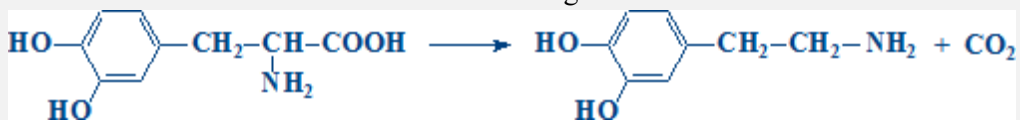
158. Select the correct statements about the following chemical reaction:



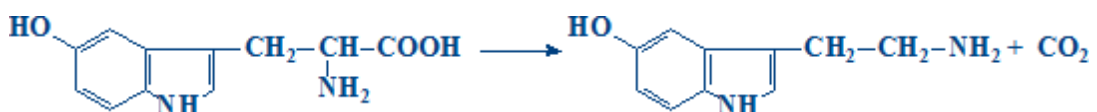
159. Select the correct statements about the following chemical reaction:



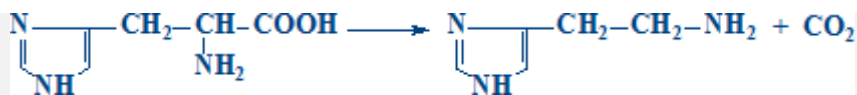
160. Select the correct statements about the following chemical reaction:



161. Select the correct statements about the following chemical reaction:



162. Select the correct statements about the shown chemical reaction:



163. Serotonin is synthesized from the following amino acid:
164. The precursor of catecholamines is:
165. Which compound is the precursor of histamine?
166. For the synthesis of which compounds can ammonia (NH₃) be used?
167. How many ATP molecules are needed to synthesize one urea molecule?
168. How many high-energy bonds are necessary for the synthesis of 100 molecules of urea?
169. In which processes is ammonia produced?
170. In which processes is ammonia produced?
171. NH₃ can be used for the:
172. Renal excretion of ammonia - select the correct statement about the process:
173. Select ornithine cycle reactions:
174. Select ornithine cycle reactions:
175. Select the correct statements about the chemical reaction:
176. Select the correct statements about the reaction of carbamoyl phosphate synthesis - the first reaction of urea synthesis:
177. Select the urea cycle enzymes:
178. Select the urea cycle enzymes:
179. The connection between Krebs cycle and urea cycle:
180. Urea cycle (first reaction)- select the correct statements:
181. Ureagenesis - choose the correct statements about the process:
182. Ureagenesis - select the correct statements:
183. What are the end products of simple proteins catabolism?
184. What are the final products of complete NH₃ detoxification?
185. Biosynthesis of asparagine (Asn) - choose the correct statements about the reaction:
186. Biosynthesis of glutamine (Gln) - choose the correct statements about the reaction:
187. Choose the correct statements about carbohydrate and lipid metabolisms connections:
188. Choose the correct statements about protein and carbohydrate metabolisms connection:
189. Choose the correct statements about the catabolism of amino acids:
190. Choose the enzyme involved in amino acids catabolism:
191. Protein and lipid metabolisms connection - choose the correct statements:
192. Select the enzymes involved in amino acid catabolism:
193. Select the statements that characterize protein deficiency:
194. Biosynthesis of cytidylic nucleotides:
195. Biosynthesis of thymidine nucleotides - select the correct statements:
196. Clinical manifestations of gout:
197. Digestion of nucleoproteins - select the correct statements:
198. GMP synthesis from inosine monophosphate (IMP) - select the correct statements:
199. Inosine monophosphate (IMP) - select the correct statements:
200. Phosphoribosyl-pyrophosphate synthesis (PRPP) - select the correct statements about the first reaction of purine nucleotide synthesis:
201. Regulation of the purine nucleotides synthesis - choose the correct statements:
202. Select the chemical compounds necessary for the synthesis of purine nucleotides:
203. Select the chemical compounds that are involved in purine nucleotides synthesis:
204. Select the correct statements about the reaction of carbamoyl phosphate synthesis - the 1st reaction of pyrimidine nucleotide synthesis:
205. Select the statements that characterize gout:

206. Synthesis of phosphoribosylamine from phosphoribosyl pyrophosphate (PRPP) - select the correct statements about the second reaction of purine nucleotide synthesis:
207. What amino acid is a donor of the -NH₂ group in the pathway of GMP synthesis from IMP?
208. What amino acid is a donor of the -NH₂ group in the pathway of AMP synthesis from IMP?
209. What compounds are the sources of atoms for the pyrimidine ring?
210. What is characteristic for the carbamoyl phosphate synthesis reaction - the 1st reaction of pyrimidine nucleotides synthesis:
211. What is the final product of purine nucleotide catabolism in humans?
212. What statements characterize the synthesis pathway of AMP from inosine monophosphate (IMP):
213. Bilirubin - select the correct statements regarding the compound:
214. Catabolism of hemoglobin (Hb) - select the correct statements regarding the process:
215. Catabolism of hemoglobin is characterized by the following statements:
216. Catabolism of hemoglobin. What statements are correct regarding biliverdin transformation into bilirubin?
217. Causes of hepatic jaundice are the following:
218. Causes of jaundice are the following:
219. Conjugation of bilirubin - select the statements that characterize the process:
220. Heme biosynthesis - select the compounds required for the process:
221. Heme biosynthesis - select the correct statements about the first reaction of the process:
222. Heme biosynthesis - select the correct statements regarding the second reaction of the process:
223. Heme biosynthesis - select the correct statements regarding the conversion of protoporphyrin IX into heme:
224. Hemoglobin (Hb) - which statements characterize its structure?
225. Hemoglobin (Hb) catabolism - choose the correct statements about the conversion of Hb to biliverdin:
226. Hemoproteins - select the correct statements:
227. Prehepatic jaundice - select the statements that characterize the disorder:
228. Renal excretion of bile pigments - select the correct statements:
229. Select causes of jaundice:
230. Select the compound responsible for iron cellular storage:
231. Select the compound responsible for the blood iron transport:
232. What are the stages of bilirubin metabolism in the intestine?
233. What changes in bile pigments occur in posthepatic jaundice?
234. What changes of bile pigments occur in hepatic jaundice?
235. What is the cause of posthepatic jaundice?
236. What processes does hemoglobin participate in?
237. Which of the following statements about blood bilirubin are correct?
238. Which proteins belong to the class of chromoproteins?
239. Choose the correct statement about bilirubin:
240. Choose the correct statement about conjugated bilirubin:
241. Choose the correct statement about unconjugated bilirubin:
242. Select the possible cause of posthepatic jaundice:
243. Select the possible cause of prehepatic jaundice:
244. Which of the following statements about hormones is correct?
245. Cytosolic-nuclear mechanism of action of hormones - select the correct statement:
246. Membrane-intracellular mechanism of hormone action - select the correct statement:
247. Membrane-intracellular mechanism of hormone action - select the correct statements:
248. Select hormone second messengers:
249. Select the classes of hormones according to the structural classification:

250. Select the correct statement regarding Gs proteins:
251. Select the correct statements about the active form of Gs protein:
252. Select the correct statements about the membrane-intracellular mechanism of hormone action mediated by diacylglycerol (DAG) and inositol triphosphates (IP3):
253. Select the correct statements regarding adenylate cyclase:
254. Select the correct statements regarding protein kinase A:
255. Select the correct statements regarding the hormones:
256. Select the hormone that acts through the cAMP-mediated membrane-intracellular mechanism:
257. Select the hormone that acts through the cAMP-mediated membrane-intracellular mechanism:
258. Select the hormone that has membrane-intracellular mechanism of action:
259. Select the ion that is a second messenger of hormones:
260. Select the reaction catalyzed by phosphoprotein phosphatases:
261. What are the properties of phospholipase C?
262. Which classes of conjugated proteins do hormone receptors belong to?
263. Which hormone has cytosolic-nuclear mechanism of action?
264. Which hormone has cytosolic-nuclear mechanism of action?
265. Which hormone has cytosolic-nuclear mechanism of action?
266. Which of the following compound is biologic active?
267. Biosynthesis of iodothyronines - select the correct statements:
268. Calcitonin - select the correct statements regarding the hormone:
269. Choose the compound that regulates the secretion of parathyroid hormone:
270. Diabetes mellitus - select the disorders that are specific for the disease:
271. Select hormone that is synthesized in the adrenal cortex:
272. Select the compounds involved in the maintenance of the extracellular calcium homeostasis:
273. Select the correct statement about iodothyronines:
274. Select the correct statements about steroid hormones:
275. Select the correct statements about the biosynthesis of the pancreatic hormones:
276. Select the correct statements about the regulation of synthesis and secretion of glucocorticoids:
277. Select the correct statements regarding the biologic effects of the parathyroid hormone:
278. Select the disorders specific for hyperparathyroidism:
279. Select the disorders specific for hypoparathyroidism:
280. Select the metabolic effects of insulin:
281. Select the metabolic effects of T3 and T4:
282. Thyroglobulin - select the correct statements about the compound:
283. Thyrotropin (TSH) - select the correct statements regarding the compound:
284. What are the metabolic effects of T3 and T4?
285. What are the signs of hypothyroidism in adults (myxedema)?
286. What compounds stimulate insulin secretion?
287. What processes are stimulated by insulin?
288. What statements are characterizing insulin?
289. What statements characterize 1,25-dihydroxycholecalciferol - calcitriol?
290. What statements characterize the mechanism of action of insulin?
291. Which are the signs of thyroid hyperfunction?
292. Which compounds are transporting iodothyronines in the blood?
293. Which factors influence the synthesis and secretion of iodothyronines?
294. Which is the metabolic effect of calcitonin?
295. Which of the following effects does insulin have on lipid metabolism?

296. Which of the following effects does insulin have on protein metabolism?
297. Which statements are correct regarding the parathyroid hormone?
298. Select the correct statements about the Cushing's syndrome:
299. What is the purpose of using corticosteroids as medicines?
300. Azotemia occurs in following cases:
301. Functions of blood are the following one:
302. Hyperproteinemia. Which statements characterize the condition?
303. Hypokalaemia. Which statements characterize the condition?
304. Hypoproteinemia. Which statements characterize the condition?
305. Plasma globulins. Which statements are correct regarding the compound?
306. Plasma proteins - select the correct statements:
307. Select from the following list the organic compounds of the blood:
308. Select from the following list the organic compounds of the blood:
309. Select the blood cells:
310. Select the correct statements about iron and its metabolism:
311. Select the correct statements about the changes of plasma calcium:
312. Select the correct statements regarding the blood calcium:
313. Select the enzyme that is a marker of heart diseases:
314. Select the non-nitrogen containing organic compound in the blood:
315. Select the non-nitrogen containing organic compounds of the blood:
316. Select the non-protein nitrogen-containing compound of the blood:
317. Select the non-protein nitrogen-containing compound of the blood:
318. Serum albumin - select the correct statements regarding the compound:
319. Serum albumin - select the correct statements regarding the protein:
320. Serum albumin - select the correct statements:
321. What are the functions of plasma proteins?
322. Which of the following compounds is transported by the serum albumins?
323. Which of the following are blood cells?
324. Functional classification of serum enzymes - select the correct classes:
325. Select the enzyme that is marker of liver diseases:
326. Select the enzymes that are markers of heart diseases:
327. Select the enzymes that are markers of liver diseases:
328. Select the organo-specific enzyme of skeletal muscles:
329. Select the secretory enzymes:
330. Select the correct statement regarding salivary alpha-amylase:
331. Select the correct statements regarding lysozyme:
332. Select the correct statements regarding mucinase:
333. Select the major salivary glands that produce saliva:
334. Select the salivary enzymes:
335. Select the specific salivary protein:
336. What are the causes of hyposalivation (hypoptialism)?
337. What are the physiologic causes of hypersalivation (sialorrhoea or ptialism)?
338. What is the chemical composition of saliva?
339. What is the diurnal average volume of saliva?
340. What mineral compounds ARE NOT found in saliva under physiological conditions?