BATCH 27

Reg. No.										

MANIPAL UNIVERSITY

MBBS PHASE I STAGE I DEGREE EXAMINATION – AUGUST 2011

SUBJECT: BIOCHEMISTRY – I (ESSAY)

Thursday, August 18, 2011

Time: 09:00 – 11:00 Hrs. Max. Marks: 60

- **Answer ALL questions. Write brief, relevant and legible answers.**
- **Draw diagram, flow charts wherever appropriate.**

1. Describe the different types of enzyme regulation with one example each.

(6 marks)

2. Oxidation of acetyl CoA yields energy. Justify this statement.

(8 marks)

3. Explain the chemiosmotic theory of oxidative phosphorylation.

(4 marks)

4. Write the detailed reactions of triglyceride synthesis and breakdown in the adipose tissue and add a note on its regulation.

(6 marks)

5. Mrs. Neela, a labourer working at a construction site, has been having a daily diet containing 150 g of digestible carbohydrates, 125 g of proteins, 100 g of fats, 10g of fibres, adequate quantities of all vitamins and minerals and plenty of water.

5A. Calculate the total calories that she gets from this diet.

5B. Describe the process of absorption and transport of the products of lipid digestion from the intestine to the liver.

(2+8 = 10 marks)

6. Write a detailed account of the biosynthesis of mature collagen.

(6 marks)

7A. Define and classify acidosis.

7B. Explain the role of ammonia buffer in correcting the acidosis.

(2+4 = 6 marks)

8. Describe the procedure and applications of polymerase chain reaction.

(5 marks)

9. A 6 year old child was brought to the doctor by his mother, who complained about his poor night vision. After examination the child was suspected to have vitamin deficiency and was put on appropriate supplements.

9A. Name the deficient vitamin.

9B. Explain the role of this vitamin in vision.

(½+3½ = 4 marks)

10. Describe the steps of complete detoxification of ammonia in the liver.

(5 marks)

BATCH

Reg. No.										

MANIPAL UNIVERSITY

MBBS PHASE I STAGE I DEGREE EXAMINATION – AUGUST 2011

SUBJECT: BIOCHEMISTRY – II (MCQs)

Thursday, August 18, 2011

Time: 11:30 – 12:30 Hrs. Max. Marks: 120

INSTRUCTIONS

1. For each statement, select **T** (True) or **F** (False) as your choice.
2. Indicate your choice by darkening the appropriate circle in the answer sheet provided.
3. Use only HB or 2B pencils to darken the circle.
4. Leave blank for Don't Know response.
5. Scoring systems is as follows:

For every **Correct** response	**1** mark is awarded
For every **Wrong** response	**0.5** mark is deducted
For every **Don't Know** response	**No** mark is deducted

6. Indicate your roll number (Registration Number) clearly and correctly.
7. Do not write anything in the question paper.
8. The true/false statements are numbered 101 to 160 and 201 to 260 (Total 120 statements).
9. This question paper contains **03 pages**. Please make sure that the question paper provided to you has all the pages.

Peptide bonds

101. Are ionic bonds
102. Are formed between two sugar residues
103. Are broken by denaturing agents
104. In glutathione are three in number
105. Have partial double bond character

The alpha helix found in proteins

106. Is a secondary structure
107. Has hydrogen bonds linking adjacent amino acids
108. Has side chain groups of amino acids projecting outwards
109. Has five amino acid residues per turn of the helix
110. Is predominantly found in hemoglobin

Ceruloplasmin

111. Is a copper binding protein
112. Level in blood increases in Wilson's disease
113. Is found in the α-2 band during electrophoresis of serum proteins

The mitochondrial matrix contains enzymes for

114. Glycolysis
115. Heme synthesis
116. Glycogenolysis
117. HMP shunt
118. β-oxidation

Hemoglobin

119. Is a conjugated protein
120. F has higher oxygen affinity than HbA
121. Synthesis requires glycine
122. Affinity to oxygen increases at high pH

Regarding iron

123. Absorption in the intestine is favoured by phytates in the diet.
124. Is transported by albumin
125. TIBC level increases during its deficiency
126. Is required as a cofactor for PDH complex

NADPH is

127. A major source of energy in the RBCs
128. A cofactor for glutathione reductase
129. Produced in the reaction catalysed by 6-phosphogluconate dehydrogenase
130. Required for reductive biosynthesis of lipids
131. Required for phagocytosis in WBCs

Regarding carbohydrates

132. Sucrose is a reducing disaccharide
133. Chondroitin sulphate is an anticoagulant
134. Galactose is found in glycoproteins
135. Mannose is a C-2 epimer of glucose

Regarding serum markers for myocardial infarction

136. CK-MB is the first enzyme to increase
137. LDH -1 levels are used in assessing the infarction 48 hours after onset of chest pain
138. AST levels are higher than ALT
139. Cardiac troponin I is increased 48 hours after onset of chest pain

Biochemical findings in jaundice associated with cholelithiasis include

140. Increased serum direct bilirubin
141. Marked increase in serum ALP
142. Prolonged prothrombin time
143. Presence of bile salts and pigment in the urine
144. Pale coloured stools

High density lipoproteins

145. Scavenge cholesterol from extrahepatic tissues
146. Bind to lecithin cholesterol acyl transferase in circulation
147. Contain the highest amount of protein among lipoproteins
148. Are synthesised by the liver
149. Transport triglycerides to the adipose tissue

Vitamin C is required for the synthesis of

150. Bile acids
151. Calcitriol
152. Serotonin

Basal metabolic rate

153. Increases in hyperthyroidism
154. For adult males is 40kcal/m^2 of body surface area/hour
155. Is higher in adults than in children
156. Is measured two hours after meal

Saturated fatty acid/s

157. Increase plasma cholesterol levels
158. Contain at least one double bond
159. Are found in high concentration in coconut oil
160. With 16 carbons is palmitic acid

BATC

Brush border enzymes digesting carbohydrates include

201. Maltase
202. Sucrase-isomaltase
203. Aminopeptidase
204. Lactase

Compounds with antioxidant activity include

205. Vitamin E
206. Hydrogen peroxide
207. Glutathione
208. Superoxide
209. Ethanol

Alcohol consumption

210. Over a long period causes fatty liver
211. Increases the NADH/NAD^+ ratio in cells
212. Causes fasting hypoglycemia
213. Results in an increase in cellular pyruvate concentration

Gluconeogenesis

214. Is increased during muscular exercise
215. From pyruvate occurs via conversion to acetyl CoA
216. From oxaloacetate requires energy input
217. Is activated by cAMP
218. Is regulated by fructose 1,6-bisphosphatase

Vitamin D

219. Synthesis is activated by thyroid hormone
220. Requires bile salts for its absorption
221. Increases the absorption of calcium from intestine
222. Deficiency causes scurvy in children

Creatinine

223. Reversibly donates phosphate group to ADP to form ATP
224. Is synthesized from fatty acids
225. Levels in serum are measured to assess severity of renal failure
226. Coefficient is more in males than in females

Glycogen synthase is

227. Allosterically activated by glucose 6-phosphate
228. Active in the phosphorylated form
229. Inhibited by insulin in the liver
230. Activated by glucagon in the muscles

Triiodothyronine (T_3)

231. Synthesis is increased in Grave's disease
232. Has a longer plasma half life than T_4
233. Binds with more affinity to target cell receptors than T_4
234. Is synthesized from Tryptophan
235. Synthesis is inhibited by perchlorates

Regarding second messengers

236. Insulin uses the kinase cascade system to mediate its actions
237. G_s protein is active when bound to GTP
238. One calcium ion binds to four molecules of calmodulin
239. Phosphodiesterase hydrolyzes cAMP to 5'AMP

Galactose

240. Is phosphorylated to galactose 6-phosphate by galactokinase
241. Is released from lactose by lactase
242. Is converted to galactitol by aldose reductase
243. 1-phosphate uridyl transferase is defective in classic galactosemia

The neurotransmitter

244. Serotonin is excreted as vanillyl mandelic acid
245. GABA is an excitatory neurotransmitter
246. Acetylcholine is a neuropeptide
247. Glycine is an inhibitory neurotransmitter
248. Dopamine crosses blood brain barrier

Ketone bodies

249. Are synthesized in the liver during prolonged starvation
250. Are oxidised in the mitochondria of liver
251. Are synthesized from succinyl CoA
252. When in excess, cause metabolic acidosis

Regarding mutation

253. Substitution of adenine by guanine is called transversion
254. Addition of one base leads to a shift in the reading frame
255. Change in codon from UAC to UAG results in premature termination of translation
256. HbS is an example of silent mutation

Regarding DNA polymerase

257. 3'→5' exonuclease activity functions for proofreading
258. Polymerase I fills gaps produced during removal of RNA primer
259. Polymerase III has an inherent primase activity
260. It is inhibited by erythromycin