BATCH 28

Reg. No.										

MANIPAL UNIVERSITY

MBBS PHASE I STAGE I DEGREE EXAMINATION – FEBRUARY 2012

SUBJECT: BIOCHEMISTRY – I (ESSAY)

Wednesday, February 15, 2012

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. Explain how mature RBCs generate energy and add a note on the energetics of this pathway.

(8 marks)

2. Explain anaplerotic reactions with two examples.

(3 marks)

3. Write short notes on:

3A. Chemiosmotic hypothesis.

3B. Thalassemias.

(3+3 = 6 marks)

4. With the help of a suitable diagram explain the transport of absorbed dietary lipids to the liver

(5 marks)

5. A five day old newborn upon examination by the neonatologist was found to have yellowish discoloration of skin, sclera and mucous membranes. The child was irritable and serum total bilirubin was 26 mg%.

5A. What is your diagnosis?

5B. Write the reactions which lead to the formation of the yellow compound and its fate in the body.

(½+5½ = 6 marks)

6. Explain lipid peroxidation in detail and add a note on factors preventing it.

(4 marks)

7. What is protein-energy malnutrition? Give TWO differences between kwashiorkor and marasmus.

(3 marks)

8. Describe the calcium phosphatidylinositol mechanism of hormone action and name TWO hormones that act by this mechanism.

(4 marks)

9. Give reasons for the following:

9A. Acetone breath is a feature of uncontrolled Type I diabetes mellitus.

9B. Hyperuricemia is seen in Von Gierke's disease.

9C. Plasma bicarbonate is high in compensated respiratory acidosis.

(3×3 = 9 marks)

10. Discuss the defect, clinical, biochemical findings and basis of neurological symptoms in Wilson's disease.

(4 marks)

11. Describe in detail the process of prokaryotic transcription.

(5 marks)

12. Write short notes on Southern blotting.

(3 marks)

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MBBS PHASE I STAGE I DEGREE EXAMINATION – FEBRUARY 2012

SUBJECT: BIOCHEMISTRY – II (MCQs)

Wednesday, February 15, 2012

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.

Phosphatidylcholine

101. Is a derived lipid
102. Contains sphingosine
103. Is also known as cephalin
104. Is a lipotropic factor

Nephrotic syndrome is characterised by

105. Loss of α-2 macroglobulin in urine
106. Low serum albumin concentration
107. Bridging of β and γ bands in serum protein electrophoresis
108. Generalised edema

Heme synthesis

109. Is regulated by ferrochelatase
110. Requires vitamin B_6
111. Requires an intermediate of TCA cycle
112. Releases NH_3

Glucose 6-phosphate dehydrogenase

113. Catalyses a reversible reaction
114. Generates NADH+ H^+
115. Is regulated by insulin
116. Deficiency results in photosensitivity

Iron

117. RDA is 10mg in males
118. Is absorbed in the Fe^{2+} state
119. Is stored bound to transferrin
120. Excess manifests as hemosiderosis
121. Deficiency causes megaloblastic anemia

Folic acid

122. As methylene tetrahydrofolate is required for epinephrine synthesis
123. Is richly found in green leafy vegetables
124. Is required for erythropoiesis
125. Gets trapped as methyl tetrahydrofolate in cobalamine deficiency

The citric acid cycle

126. Oxidises malonyl CoA during starvation
127. Occurs in the mitochondria
128. Regulates glycolysis
129. Contributes to fatty acid synthesis

Glutathione peroxidase

130. Detoxifies hydrogen peroxide
131. Produces oxidised glutathione as a product
132. Causes oxidation of the RBC membrane
133. Is a selenium containing enzyme

Coenzyme Q

134. Is protein in nature
135. Is a mobile electron carrier
136. Transfers electrons between complex III and IV

High density lipoprotein

137. Is synthesized in the liver
138. Contains apo B-100
139. Is involved in reverse cholesterol transport
140. Serves as a reservoir of apo CII in circulation

Risk factors for myocardial infarction include

141. High homocysteine levels in blood
142. Blood LDL cholesterol more than 260 mg/dl
143. Absence of Lp(a) in blood
144. Hypothyroidism

Basal metabolic rate (BMR)

145. Increases in pregnancy
146. Is higher in cold climate
147. In a hyperthyroid person will be less than 30 $kcal/m^2/hr$
148. Is measured 2 hours after a meal

Biochemical parameters measured in serum for cardiac risk assessment are

149. Triglycerides
150. CK-MB
151. hsCRP
152. Troponin T

Refsum's disease is characterized by

153. Accumulation of phytanic acid
154. Lack of α-oxidation
155. Excretion of branched chain amino acids in urine

The Wernicke- Korsakoff syndrome

156. Is seen in chronic alcoholics
157. Is characterized by nystagmus
158. Causes impaired long term memory
159. Occurs due to deficiency of thiamine

The pyruvate carboxylase reaction

160. Forms phosphoenol pyruvate as the product
201. Requires biotin
202. Is regulated by citrate
203. Takes place in the mitochondria

Regarding enzymes involved in digestion

204. Carboxypeptidase is an endopeptidase
205. Maltase is a hydrolase
206. Trypsin is active in alkaline pH
207. Pancreatic lipase produces monoacylglycerol from triacylglycerol

Following pairs correctly match the hyperlipoproteinemias with their corresponding defects

208. Type I : LDL receptor defect
209. Type II A : Lipoprotein lipase deficiency
210. Type III : Abnormal apo E
211. Type IV : Overproduction of VLDL

Biochemical indicators of obstructive jaundice include

212. Increased serum conjugated bilirubin
213. Markedly increased serum alkaline phosphatase
214. Markedly increased serum transaminases
215. Prolonged prothrombin time

Nitric oxide

216. Is synthesized from lysine
217. Is a smooth muscle relaxant
218. Increases platelet aggregation
219. Synthesis requires NADPH

Cushing's syndrome is characterized by

220. Low plasma ACTH when caused by an anterior pituitary tumour
221. Lipolysis in the face and trunk
222. Hypernatremia
223. High plasma cortisol in the evening

Regarding plasma glucose

224. Fasting level of more than 126 mg/dl is diagnostic of diabetes mellitus
225. It is increased in von Gierke's disease
226. Less than 40 mg/dl is characterized by dizziness and confusion
227. It peaks 2 hours after a meal

The active form of vitamin D

228. Is 24, 25- dihydroxycholecalciferol
229. Is formed in the liver
230. Formation is increased by PTH
231. Increases calcium reabsorption in the kidney

Glycogen synthesis

232. Increases in the presence of glucagon
233. Is regulated by glycogen phosphorylase
234. In muscle is increased by epinephrine
235. Requires UDP-glucose
236. Is defective in McArdle's disease

Dopamine

237. Is synthesized from epinephrine
238. Is an inhibitory neurotransmitter
239. Deficiency causes Parkinson's disease
240. Synthesis requires vitamin C

Carbamoyl phosphate

241. Synthetase I occurs in the mitochondria
242. Is converted to citrulline by reacting with ornithine
243. Formation requires hydrolysis of 2 high energy bonds
244. Is an intermediate in purine synthesis

Ketone bodies

245. Make the pH of blood alkaline
246. Are synthesized in the muscle
247. Are utilized by the liver
248. Are synthesized from acetyl CoA

During DNA replication

249. DNA polymerase III reads the template strand in the 5'→3' direction
250. The proof reading of newly formed strand is done in the 3'→5' direction
251. DNA polymerase I uses 5'→3' exonuclease activity to remove RNA primer
252. DNA ligase activity requires energy

During post-transcriptional modification

253. A 7-methylguanosine residue is attached to the 3' end of the mRNA
254. A chain of adenine nucleotides is attached to the 5' end of the mRNA
255. Exons are removed
256. CCA sequence is attached to the 3' end of the tRNA

Regarding inhibitors of translation

257. Streptomycin distorts ribosome structure
258. Tetracyclines block access of aminoacyl t-RNA to the A-site of ribosome
259. Diphtheria toxin inhibits the translocation step of eukaryotic translation
260. Chloramphenicol inhibits peptide bond formation