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MANIPAL UNIVERSITY

MBBS PHASE I STAGE I DEGREE EXAMINATION – FEBRUARY 2013

SUBJECT: PHYSIOLOGY – I (ESSAY)

Monday, February 11, 2013

Time: 09:00 – 11:00 Hrs

Max. Marks: 60

- 1A. Draw a neat labeled diagram of a nerve action potential and mention two properties of it.
- 1B. Write one similarity and one difference between facilitated diffusion and active transport.
(2+1)+2 = 5 marks)
2. With the help of a flow chart, list the events leading to the generation of a muscle action potential in skeletal muscle.
(5 marks)
- 3A. Describe the regulation of erythropoiesis.
- 3B. Give the physiological basis for the following:
- i. Blood clotting is prolonged in vitamin K deficiency
 - ii. Person with AB positive blood group is considered universal recipient.
(3+(1+1) = 5 marks)
- 4A. Explain chloride shift.
- 4B. Define anemic hypoxia and hypoxic hypoxia. In which of these types cyanosis is not seen and why?
(3+2 = 5 marks)
- 5A. Define cardiac output. Explain the effect of sympathetic stimulation on cardiac output.
- 5B. Draw labelled graphs showing effect of changes in myocardial contractility on Frank- Starling curve.
(2+3 = 5 marks)
6. A thirty three year old woman presented to the emergency department with lower back pain. Physical examination showed excess fat deposits in the central axis including her face, shoulders and abdomen. Her extremities were thin and exhibited muscle atrophy. There were several ulcers on her left leg. Her skin was thin and dry with large, purple bruises on her abdomen.
- 6A. Name the above endocrine disorder and mention the cause for it.
- 6B. Give reason for two clinical manifestations seen in the above patient.
- 6C. What could be the ACTH level in the above lady?
(2+2+1 = 5 marks)

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MANIPAL UNIVERSITY

MBBS PHASE I STAGE I DEGREE EXAMINATION – FEBRUARY 2013

SUBJECT: PHYSIOLOGY – II (MCQs)

Monday, February 11, 2013

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 **04 pages**. Please make sure that the question paper provided to you has all the pages.

The resting membrane potential of a cell

101. Is usually equal to the equilibrium potential for sodium
102. Falls to zero immediately when $\text{Na}^+ - \text{K}^+$ ATPase in the membrane is inhibited
103. Is dependent on the permeability of cell membrane to potassium
104. Is markedly altered if the extracellular sodium concentration is increased

Regarding parasympathetic nervous system

105. The axons of postganglionic neurons are usually shorter than those of preganglionic neurons
106. Acetylcholine is the neurotransmitter released at preganglionic nerve terminal
107. Stimulation of parasympathetic nerve decreases the vagal tone

Regarding smooth muscle

108. It has unstable resting membrane potential
109. Multiunit smooth muscle is present in urinary bladder
110. Troponin is the calcium binding protein

T-tubules are

111. Well developed in smooth muscle
112. Located at A-I-junction in skeletal muscle
113. Part of sarcotubular system

Lymphocytes

114. Are formed in the bone marrow
115. Are part of body's defense against viral fever
116. Level decreases after glucocorticoid injection

Erythroblastosis foetalis

117. Occurs when Rh positive mother conceives a Rh negative fetus
118. Is prevented by injecting anti Rh to the foetus immediately after birth
119. Leads to jaundice in the newborn

Hematocrit value

120. Is about 45% on an average in normal adults
121. Of 45% means, 45% of the total blood volume is made up of blood plasma
122. Increases in polycythemia
123. Decreases during excessive sweating

Factors that promote heat gain include

124. Stimulation of sympathetic nervous system
125. Muscular exercise
126. Cutaneous vasodilation
127. Sweating

Regarding oxygen-dissociation curve

128. It is sigmoid in shape
129. The X-axis indicates the partial pressure of oxygen in alveoli
130. At a PO_2 of 20 mmHg, Hb is 75% saturated
131. Increased temperature shifts the curve to the right
132. Steep part of the curve operates in the tissues

Airway resistance

133. Decreases upon parasympathetic stimulation
134. Increases during inspiration
135. Decreases in chronic obstructive pulmonary disease
136. Is greatest in medium sized bronchioles

Surfactant lining the alveoli

137. Helps prevent alveolar collapse
138. Is decreased in hyaline membrane disease
139. Is a mixture of proteins and lipids
140. Is secreted by type I alveolar cells

The first heart sound

141. Is produced by the opening of AV valves
142. Has lower pitch than second heart sound
143. Has longer duration than second heart sound

The aortic pressure

144. Curve shows dicrotic notch
145. Is lower than left ventricular pressure during slow filling phase
146. Increases during rapid ejection phase
147. Is normally 80 mmHg

Peripheral resistance in systemic vessels is increased by

148. Angiotensin II
149. Histamine
150. Acetylcholine

In normal electrocardiogram

151. P wave indicates atrial depolarisation
152. QRS complex corresponds to ventricular depolarisation
153. T wave indicates ventricular repolarisation

Baroreceptor/s

- 154. Are located in aortic and carotid bodies
- 155. Are useful in short term regulation of blood pressure
- 156. Stimulation decreases heart rate
- 157. Operate in the pressure range of 70 to 150 mmHg

Growth hormone

- 158. Secretion is stimulated by somatomedins
- 159. In excess causes acromegaly in adults
- 160. Is secreted by somatotrophs of anterior pituitary

An increase in plasma parathyroid hormone (PTH) level would lead to

- 201. Increase in plasma calcium concentration
- 202. Decrease in plasma inorganic phosphate concentration
- 203. Increased bone resorption
- 204. Sustained contraction of muscle

Thyroid stimulating hormone

- 205. Level increases in primary hypothyroidism
- 206. Is a steroid hormone
- 207. Is released from hypothalamus
- 208. Level increases when exposed to cold temperature

Destruction of beta cells of pancreas leads to

- 209. Increase in plasma glucose level
- 210. Decrease in plasma insulin level
- 211. Decrease in plasma glucagon level

Estrogen

- 212. Causes proliferation of uterine endometrium
- 213. Decreases sensitivity of uterine muscle to oxytocin
- 214. In high level inhibits lactation during pregnancy

Spermatogenesis

- 215. Begins soon after birth
- 216. Requires temperature about 3°C higher than the core body temperature
- 217. Requires testosterone
- 218. Is absent following vasectomy

Gastric juice secretion

- 219. Is stimulated by histamine
- 220. Is about 500 ml per day
- 221. Is inhibited by atropine

During deglutition

- 222. There is temporary cessation of breathing
- 223. Elevation of soft palate prevents the entry of bolus into the nasopharynx
- 224. Oesophageal phase is aided by peristaltic waves

Cholecystokinin

- 225. Is secreted from the pancreas
- 226. Secretion is stimulated by fatty meal
- 227. Stimulates contraction of gall bladder

Cephalic phase of gastric juice secretion is

- 228. Initiated before food enters the stomach
- 229. Mediated mainly by vagus nerve
- 230. Inhibited by sight and smell of food

Regarding micturition reflex

- 231. Detrusor muscle and internal sphincter relax during micturition
- 232. External sphincter is a smooth muscle
- 233. It is completely an involuntary process
- 234. Centre is in sacral spinal segment

Proximal convoluted

- 235. Tubular fluid osmolality is 300 mosm/L
- 236. Tubule reabsorbs water
- 237. Tubule reabsorbs glucose completely
- 238. Tubule is located in the cortex of kidney in cortical nephrons

Impulses generated in taste buds

- 239. Other than tongue area reach the brainstem via vagus
- 240. Of anterior two third of tongue is carried by IX cranial nerve
- 241. Are carried by sensory nerves that cross the midline at spinal cord level
- 242. Are conveyed by sensory nerves that reach the cerebral cortex via thalamus

Regarding colour vision

- 243. Red, green and yellow are considered as primary colours
- 244. Colour blindness is common in males
- 245. Tritanopia is a condition in which cones sensitive to red colour are absent
- 246. Trichromats have all three cone systems

Thalamus

- 247. Is the relay station for all sensory pathways except olfactory pathway
- 248. Has non-specific nuclei, which project to the cortex in a diffuse manner
- 249. When damaged can lead to impairment of sensory perception

Cerebrospinal fluid

- 250. Acts as shock absorber
- 251. Decreases the weight of the brain by providing buoyancy
- 252. Is present in sub-arachnoid space
- 253. Is formed in the arachnoid villi

Lesion in

- 254. Ventromedial nucleus of hypothalamus produces obesity
- 255. Supraoptic and paraventricular regions of hypothalamus produces loss of thermoregulation
- 256. Suprachiasmatic nucleus leads to decreased secretion of anterior pituitary hormones

Fast pain differs from slow pain in that it is

- 257. Poorly localized
- 258. Dull and aching in nature
- 259. Conducted by A δ myelinated nerve fibers
- 260. Not felt in most of the deeper tissues

