

Reg. No.

MANIPAL UNIVERSITY

MBBS PHASE I STAGE I DEGREE EXAMINATION – AUGUST 2013

SUBJECT: PHYSIOLOGY – I (ESSAY)

Monday, August 12, 2013

Time: 09:00 – 11:00 Hrs

Max. Marks: 60

1. A 25 year old male was brought to the emergency room in an unconscious state. Examination revealed a 2 inch stab wound to the back at the level of T6. Neurological examination revealed complete loss of motor functions below T6 on the left side and loss of fine touch and proprioceptive sensations on the right side.
- 1A. Name the above condition. *left*
- 1B. Draw the neural pathway that carries fine touch and proprioceptive sensations.
- 1C. Comment on the perception of pain and temperature sensations in the above patient. (1+3+1 = 5 marks)
2. In the form of a flow chart, outline the sequence of events in synaptic transmission. (5 marks)
3. Describe the regeneration of an injured neuron and list the factors affecting nerve regeneration. (3+2 = 5 marks)
- 4A. Name the major plasma proteins. Mention one function of each.
- 4B. Mention any two hazards of mismatched blood transfusion. (3+2 = 5 marks)
5. Mention any six factors that influence myocardial contractility. Draw graphs showing the effects of changes in myocardial contractility on the Frank-Starling curve. (3+2 = 5 marks)
6. Janine, a 36 year old woman met her physician with complaints of general weakness, nervousness, heat intolerance, increased sweating and weight loss in the past two months in spite of hyperphagia. Her physician examined her and noticed slight protrusion of eye balls and swelling in the neck. Her resting heart rate was found to be 90 beats/minute. Laboratory tests revealed decreased plasma TSH levels.
- 6A. Name the above endocrine disorder.
- 6B. Give the physiological basis for any two clinical features observed in Janine.
- 6C. Describe the normal regulation of secretion of the hormone involved in the above case. (1+2+2 = 5 marks)

7. Describe the molecular basis for length- tension relationship in skeletal muscle with the help of a graph. (5 marks)
- 8A. With the help of a diagram, describe the mechanism of hydrochloric acid ^{secretion} in the stomach. (3+2 = 5 marks)
- 8B. Describe achalasia cardia. (5 marks)
9. Explain the neural regulation of respiration. (5 marks)
10. What is the average normal value of GFR in a healthy person? Discuss the role of different forces involved in glomerular filtration. (1+4 = 5 marks)
11. Give physiological basis for the following:
- 11A. Milk ejection reflex is a neurohumoral reflex
 - 11B. Damage to Sertoli cells leads to male sterility
 - 11C. Lactation amenorrhoea
 - 11D. Ovariectomy after the sixth month does not have any effect on pregnancy
 - 11E. Plasma FSH and LH levels decrease during luteal phase of ovarian cycle
- (1×5 = 5 marks)
12. Define 'accommodation' of eye and draw a neat labelled diagram of the accommodation reflex pathway. (1+4 = 5 marks)



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MANIPAL UNIVERSITY**MBBS PHASE I STAGE I DEGREE EXAMINATION – AUGUST 2013****SUBJECT: PHYSIOLOGY – II (MCQs)**

Monday, August 12, 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.

Type A nerve fibers when compared to type C fibers are

101. Slow conducting
102. Unmyelinated
103. Least susceptible to local anesthetics
104. Larger in diameter

Sympathetic nerve stimulation causes

105. Contraction of smooth muscle fibres lining the blood vessels
106. Pupillary dilatation
107. Relaxation of smooth muscle of gastrointestinal tract

Cortisol

108. Helps in resisting stress
109. Lowers the number of circulating red blood cells
110. Inhibits inflammatory response to tissue injury
111. Suppresses allergic response produced by histamine
112. Increases protein synthesis

Calcitonin

113. Inhibits bone resorption
114. Lowers plasma calcium level
115. Decreases calcium excretion in urine
116. Is secreted by parafollicular cells of parathyroid gland

A 32 year old man with anterior pituitary tumor will be characterized by

117. Increased prolactin secretion
118. Prognathism
119. Bitemporal hemianopia
120. Decreased size of visceral organs
121. Enlarged hands and feet

RBC count increases

122. In high altitude
123. When erythropoietin secretion decreases
124. With low dietary intake of folic acid

Erythrocyte sedimentation rate (ESR)

125. Is decreased in pregnancy
126. Has prognostic importance
127. Decreases with increase in blood viscosity

Serum

128. Contains fibrinogen
129. Is obtained by allowing the whole blood to clot
130. Contains platelets

Platelet/s

131. Have contractile proteins called actin and myosin
132. Secrete vasoconstrictors like serotonin
133. Are nucleated blood cells

Cardiac output

134. Is increased when venodilation occurs
135. Increases when vagal tone increases
136. Decreases if afterload increases
137. Determines the systolic blood pressure
138. Is the product of heart rate and stroke volume

SA node

139. Discharge rate determines the heart rate
140. Has stable resting membrane potential
141. Is supplied by the right vagus nerve
142. Activity is decreased following stimulation of sympathetic nerves to heart

End diastolic volume increases

143. During exercise
144. During inspiration
145. On prolonged standing
146. Following venoconstriction

In an ECG from lead II

147. 'T' wave represents ventricular depolarization
148. 'P' wave represents atrial depolarization
149. Depressed ST segment suggests myocardial ischemia
150. Increased amplitude of QRS complex suggests ventricular hypertrophy
151. A tall and slender 'T' wave is characteristic of hypokalemia

Cardiac muscle

152. Functions as a syncytium
153. Obeys all or none law
154. Has a resting membrane potential of -90mV
155. Has a longer absolute refractory period

Multiunit smooth muscle

156. Contraction is more discrete & localized than that of visceral smooth muscle
157. Is found in the intestine
158. Is sensitive to circulating chemical substances

Pancreatic secretion is

- 159. Primarily under neural control
- 160. Inhibited by CCK
- 201. Essential for fat digestion
- 202. Enhanced by acid in the duodenum

Salivary secretion

- 203. From submandibular gland is of mixed type
- 204. In the acini is hypotonic to plasma
- 205. Contains proteolytic enzymes

Gall bladder

- 206. Contraction is stimulated by secretin
- 207. Emptying occurs following a fatty meal
- 208. Concentrates the bile

The carotid bodies

- 209. Have a low blood flow per gram of tissue
- 210. Are stimulated in anemia
- 211. Are excited by hypoxia
- 212. Conduct afferent impulses via the vagus nerves

P₅₀

- 213. Is the oxygen saturation of haemoglobin when the PaO₂ is 50 mmHg
- 214. Is the PO₂ at which hemoglobin is 50% saturated with O₂
- 215. Rises when the oxygen-hemoglobin dissociation curve shifts to the right
- 216. Is increased during exercise

Surfactant

- 217. Causes an increase in surface tension
- 218. Is produced by type II alveolar epithelial cells
- 219. Helps to prevent pulmonary edema
- 220. Deficiency is an important cause of hyaline membrane disease

Reabsorption of water

- 221. Occurs in ascending limb of loop of Henle
- 222. In collecting duct is controlled by aldosterone
- 223. Does not occur in the descending limb of loop of Henle
- 224. In the proximal tubule is brought about by vasopressin

Clearance value of

- 225. Glucose is zero
- 226. *p*-aminohippuric acid is same as GFR

227. Creatinine can be used to measure GFR clinically

228. Inulin is used to measure renal plasma flow

Muscle spindle

- 229. Functions as the receptor for inverse stretch reflex
- 230. Discharge increases when the muscle is stretched
- 231. Regulates muscle length during body movements
- 232. Is the regular contractile unit of the muscle

Cerebellar disorders are associated with

- 233. Ataxia
- 234. Rigidity
- 235. Intention tremor
- 236. Dysdiadochokinesia

According to gate control theory

- 237. Pain sensation can be modified at the dorsal horn of spinal cord by the simultaneous presence of a non-noxious stimuli
- 238. Touch fibre gives a collateral in the substantia gelatinosa of the dorsal horn of spinal cord
- 239. The collateral from touch fibre acts as the gate
- 240. When the gate is closed, pain impulses cannot ascend upwards

Function/s of hypothalamus include/s

- 241. Regulation of thirst
- 242. Maintaining alertness and wakefulness
- 243. Control of food intake
- 244. Serving as a relay station for sensory impulses

Progesterone

- 245. Is a thermogenic hormone
- 246. Is responsible for secretory changes in uterine endometrium
- 247. Is secreted by placenta only during the first trimester of pregnancy
- 248. Helps in thickening of the cervical mucus

Spermatogenesis

- 249. Requires an average of 28 days
- 250. Is a process that begins immediately after birth
- 251. Requires a temperature lower than normal body temperature
- 252. Occurs in the seminiferous tubules

Middle ear

- 253. Is separated from the inner ear by the tympanic membrane
- 254. Pressure is equilibrated with atmospheric pressure by the auditory tube
- 255. Muscles are involved in tympanic reflex
- 256. Is involved in intensity discrimination of sound

Taste

- 257. Sensation from anterior two-thirds of the tongue is carried by glossopharyngeal nerve
- 258. Sensation is due to the stimulation of taste buds
- 259. Fibres do not relay in thalamus
- 260. Receptors are chemoreceptors

