

MANIPAL UNIVERSITY

MBBS PHASE I STAGE I DEGREE EXAMINATION – AUGUST 2012

SUBJECT: PHYSIOLOGY – I (ESSAY)

Monday, August 13, 2012

Time: 09:00 – 11:00 Hrs

Max. Marks: 60

1. Ashwin, a first year medical student was examining sensory system of his friend Robin during a practical class. To his surprise Ashwin observed that the fine touch and vibration sensations were markedly reduced in Robin's right leg while temperature and pain sensations were intact in the same leg. Further, when Robin was asked to stand straight with eyes closed and feet close together, Ashwin noticed that his friend was swaying to his right. Ashwin brought this to his teacher's notice who advised Robin to consult a neurologist without fail.
- 1A. Name the sensory pathway that is affected in Robin and draw a labeled diagram of the same.
- 1B. Explain why Robin was swaying to his right when asked to stand straight with eyes closed.
(3+2 = 5 marks)
- 2A. Draw a labeled diagram of stretch reflex.
- 2B. Describe any three manifestations of cerebellar disorders.
(2+3 = 5 marks)
- 3A. State Landsteiner's law and mention its application with respect to ABO and Rh blood groups.
- 3B. Describe the principle behind cross-matching before blood transfusion.
(3+2 = 5 marks)
4. Classify nerve fibers based on their diameter and conduction velocity. Add a note on 'saltatory conduction'.
(5 marks)
5. Jane, a 34 year old teacher presented to the physician with complaints of shortness of breath, especially while climbing stairs. On auscultation of her chest, the physician observed that inspiration was shorter and the expiration was prolonged. On further examination, the physician made the following observations:
Respiratory rate = 26 breaths/minute
Vital capacity = 4.7 L
FEV₁ = 1.5 L
Blood gas analysis revealed a PaO₂ of 95 mmHg.
- 5A. Name the type of respiratory disorder Jane is suffering from. Justify your answer.
- 5B. Comment on the airway resistance in Jane.
- 5C. Is Jane suffering from hypoxia? Justify your answer.

(2+1+2 = 5 marks)

6. Define cardiac cycle. With the help of neat labeled graphs explain the pressure and volume changes in left ventricle during systole phase of cardiac cycle.

(1+4 = 5 marks)

7. Enumerate the factors affecting effective filtration pressure across the glomerular capillaries and explain their role.

(5 marks)

8. Describe the role of hormones in calcium homeostasis.

(5 marks)

9. Give physiological basis for the following:

9A. Blood level of pituitary gonadotropins is lowest during the luteal phase of menstrual cycle.

9B. Temporary amenorrhea occurs during lactation.

9C. 5α -reductase deficiency causes male pseudohermaphroditism.

9D. Spermatogenesis is impaired in cryptorchidism.

9E. Removal of ovaries before third month of pregnancy will lead to abortion.

(1×5 = 5 marks)

10A. Mention three differences between isotonic and isometric contractions.

10B. Describe rigor mortis.

(3+2 = 5 marks)

11. Describe various types of small intestinal movements.

(5 marks)

12. What is homonymous hemianopia? Draw a neat labeled diagram of visual pathway and indicate the site of lesion which causes left sided homonymous hemianopia.

(5 marks)



Reg. No.

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MBBS PHASE I STAGE I DEGREE EXAMINATION – AUGUST 2012

SUBJECT: PHYSIOLOGY – II (MCQs)

Monday, August 13, 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 **04 pages**. Please make sure that the question paper provided to you has all the pages.

Sensory receptors

101. Act as transducers
102. Providing information about position of the body in space are called teleceptors
103. Concerned with perception of pressure sensation are Pacinian corpuscles
104. For pain are rapidly adapting in nature

Rapid eye movement sleep (REM) is characterized by

105. Sleep spindles
106. Dreams
107. Decreased tone of neck muscles
108. Pontogeniculo-occipital (PGO) spikes

Muscle spindles

109. Provide proprioceptive information
110. Function as feedback device to maintain muscle length
111. Are innervated by alpha motor neurons
112. When stretched generates action potential in group Ia fibers

Cerebrospinal fluid (CSF)

113. Has a higher protein concentration compared to plasma
114. Is mainly formed by choroid plexus
115. Is present in subdural space
116. Absorption increases as CSF pressure falls below 70 mm H₂O

Carbon monoxide poisoning is characterized by

117. Increased levels of carbaminohemoglobin in blood
118. Shifting of oxygen-hemoglobin dissociation curve to the right
119. Histotoxic hypoxia
120. The presence of cyanosis

During inspiration

121. Ribs move outwards and upwards
122. Diaphragm moves upward
123. Intra-thoracic volume increases
124. Transpulmonary pressure decreases

Compliance of the lungs is

125. A measure of elastic recoil of the lungs
126. Decreased by surfactant
127. Increased in emphysema
128. Decreased in pulmonary congestion

Rate of impulse discharge from sinoatrial node is

129. Lowered by digitalis
130. Decreased during fever
131. Increased by stimulation of sympathetic nerves
132. Decreased by acetylcholine

Circulating vasoconstrictors include/s

133. Nitric oxide
134. Angiotensin II
135. Histamine
136. Norepinephrine
137. Serotonin

Stroke volume

138. Is the amount of blood pumped out of each ventricle per beat
139. Determines cardiac output
140. Increases upon sympathetic stimulation
141. Decreases when preload decreases

First heart sound is

142. Caused by the closure of semilunar valves
143. Heard at the end of ventricular systole
144. Of longer duration compared to second heart sound
145. Heard better at mitral and tricuspid areas over the precordium
146. Coincides with "P" wave of electrocardiogram

Plasma protein/s

147. Function as buffers
148. Exert colloidal osmotic pressure
149. Help in the transport of hormones
150. Concentration in blood decreases during severe dehydration

Red blood cell/s

151. Become crenated when placed in 0.9% NaCl solution
152. Are destroyed in the tissue macrophage system
153. Count is higher in newborns compared to adults
154. Provide innate immunity

Hemoglobin

155. Affinity for oxygen is affected by pH
156. Binds to oxygen to form oxyhemoglobin
157. Contains α and β polypeptide chains in normal adults
158. Contains iron in ferrous state after oxygenation

Myopia is

- 253. Due to an increase in anteroposterior diameter of the eyeball.
- 254. Corrected by glasses with biconvex lens
- 255. A condition in which image falls behind the retina
- 256. Genetic in origin

Deafness

- 257. Associated with aging is called presbycusis
- 258. Of sensorineural type is due to defects in the middle ear
- 259. Is tested using tuning fork with frequency of 128 cycles/second
- 260. Due to foreign body in external auditory canal is called conductive deafness

