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MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST MBBS DEGREE EXAMINATION - AUGUST 2018

SUBJECT: PHYSIOLOGY-PAPER I (ESSAY)

Monday, August 13, 2018

Time: 10:20 - 13:00 Hrs.

Maximum Marks: 80

Answer ALL the questions.

Long Essays: Ø

- A 54-year-old man walks to your office with a stooped gait taking very short steps. He is 1. accompanied by his daughter, who is helping him to sit. The lady also explains to you regarding the movement deficits her father had been having since a year. You observe the paucity of facial expressions in the man as you listen to the clinical history. After thorough neurological examination, you arrive at a tentative diagnosis of Parkinson disease.
- 1A. Explain the clinical features on which you arrived at the diagnosis of Parkinson disease.
- 1B. Based on the normal neural circuits of basal ganglia, represent how the neural circuits would be deranged to lead to this motor deficit state.
- 1C. Mention the physiological basis for treatment in this condition.

(3+5+2 = 10 marks)

Describe the role of hormones required for growth in infancy and at puberty. Explain the 2. effects on growth when any ONE of the hormones is deficient during infancy.

(7+3 = 10 marks)

Short Essays: 3.

- 3A. Illustrate locations of the motor, somatosensory, visual and auditory areas of cerebral cortex using a labeled diagram. Explain the characteristic features of sensory homunculus.
- 3B. Describe the sequence of events when glycine is released as the neurotransmitter at an axosomatic synapse.
- 3C. Explain in detail why middle ear damage causes hearing loss. How do you quantify this hearing loss?
- 3D. Explain the secretory pattern and actions of prolactin and hCG during pregnancy.
- 3E. Explain the degenerative and regenerative changes in a motor nerve fiber after it is severed.
- 3F. Using appropriate labeled diagrams, illustrate the changes in the sarcomere during skeletal muscle contraction.
- 3G. A 36-year-old man has a typical anginal pain that was referred to the medial aspect of left arm on lifting a heavy weight. Explain the basis and mechanism of referred pain. Give TWO other examples of referred pain.

- 3H. Explain the effects of damage to Broca and Wernicke area in categorical hemisphere. What is dyslexia?
- 3I. Name the sensory receptors of different parts of vestibular apparatus. How are they activated? List the functions of vestibular system.
- 3J. Give the source, target tissue and the actions of vasopressin
- 3K. Explain the clinical features of adrenocortical insufficiency.
- 3L. Draw a labeled diagram of a taste bud. Name the different chemicals that are responsible for the basic taste modalities.
- 3M. Define 'near point' of vision. Explain why near point recedes as age advances.
- 3N. Mention the actions of dihydrotestosterone. Explain the physiological basis of male pseudohermaphroditism.
- 3O. Trace and explain the pattern of secretion of estrogen, progesterone and LH during normal menstrual cycle. Mention the mechanism of action of oral contraceptive pills in women.

 $(4 \text{ marks} \times 15 = 60 \text{ marks})$



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MANIPAL ACADEMY OF HIGHER EDUCATION FIRST MBBS DEGREE EXAMINATION – AUGUST 2018

SUBJECT: PHYSIOLOGY-PAPER II (ESSAY)

Tuesday, August 14, 2018

Time: 10:20 - 13:00 Hrs.

Max. Marks: 80

All questions are compulsory.

∠ Long Essays:

- A 55 year old male patient reported with severe crushing type of precordial chest pain radiating to left shoulder and arm with profuse sweating. He was found to have a blood pressure 90/60 mm of Hg and heart rate of 55 beats/minute. The attending physician made a diagnosis of Myocardial infarction.
- 1A. List special features of coronary circulation. How is coronary blood flow regulated based on increased myocardial O₂ demand?
- 1B. What electrocardiographic findings do you expect to find in this patient?
- 1C. What is circulatory shock? What is the type of shock that is most likely to occur in this case? (6+2+2=10 marks)
- 2. Describe the following aspects of O₂ transport:
- 2A. PaO₂, total O₂ content and percentage saturation of arterial and venous blood.
- 2B. Factors influencing release of O2 at tissues.
- 2C. Explain how arterio-venous O2 difference is affected in stagnant hypoxia?

(6+2+2 = 10 marks)

3. Short answer questions:

- 3A. Explain primary active transport using two different examples.
- 3B. Explain the significance of timed vital capacity.
- 3C. Explain how baroreceptors mediate rapid adjustments in mean arterial blood pressure.
- 3D. Explain renal clearance test for estimating renal blood flow.
- 3E. Describe TWO different mechanisms that can be targeted to reduce gastric HCl secretion.
- 3F. Explain how cardiac output is regulated by changes in *preload*.
- 3G. Describe the role of bile salts in fat digestion and absorption. Mention TWO different conditions leading to steatorrhea.
- 3H. Explain the pharyngeal stage of deglutition. What is reflux esophagitis?
- 3I. List the functions of saliva. Explain why administration of atropine (anticholinergic drug) leads to deficient salivation.
- 3J. Explain the terms: Renal threshold for glucose and Transport maximum for Glucose (TmG)
- 3K. Explain how CO₂ is transported in bicarbonate form in plasma. What is Haldane effect?
- 3L. Explain the role of renal buffers in renal H^+ secretion.
- 3M. Explain the thermoregulatory changes when the body is exposed to cold climate.
- 3N. Name the types and functions of: T cells and antigen presenting cells.
- 30. Explain the functions of platelets.

 $(4 \text{ marks} \times 15 = 60 \text{ marks})$