Batch-96

MANIPAL ACADEMY OF HIGHER EDUCATION

MELAKA MANIPAL MEDICAL COLLEGE (MANIPAL CAMPUS)

MBBS PHASE – I STAGE – I DEGREE EXAMINATION – APRIL 2021

SUBJECT: PHYSIOLOGY - PART - II (ESSAY)

Thursday, April 22, 2021

Time : 10.30 am to 12.30 pm. Max. marks : 60

- ✓ **Answer all the questions**
- ✓ **Draw diagrams wherever appropriate**

1. Harry, a taxi cab driver, returned to his house in the evening after a day's work. It had been a cold day and he turned on his old kerosene-fuelled heater in a closed room. After a while, he noticed that his vision became progressively blurred. He felt lightheaded, disoriented and unsteady. Harry's neighbor who stopped by his house found him unconscious on the kitchen floor. He was rushed to the hospital where he was diagnosed with carbon monoxide poisoning. He was treated by hyperbaric oxygen therapy.

1A. What is the type of hypoxia observed in Harry?

1B. Will the peripheral chemoreceptors be stimulated in Harry? Justify your answer.

1C. Name the factors that stimulate peripheral chemoreceptors.

1D. How does hyperbaric oxygen therapy help treat Harry's condition?

(1+2+1+1 = 5 marks)

2. **Give physiological basis for the following:**

2A. Rate of diffusion is limited and reaches maximum in facilitated diffusion.

2B. Na^+-K^+ ATPase pump is electrogenic in nature.

2C. Conduction of impulse is faster in myelinated nerves.

2D. Ionic basis of hyperpolarization in nerve action potential.

2E. Increased body temperature in fever.

(5x1 = 5 marks)

3. **With the help of a flow chart describe the developmental changes during erythropoiesis. List any two factors essential for normal erythropoiesis.**

(4+1 = 5 marks)

4. **In the form of a flow chart, describe the sequence of events during neuromuscular transmission in skeletal muscle.**

(5 marks)

5. **Give physiological basis for the following:**

5A. Venous return is more during inspiration than expiration.

5B. Parasympathetic stimulation decreases the slope of prepotential of SA nodal action potential.

5C. Cardiac output decreases when the heart rate increases beyond 200 beats/min

(1+2+2 = 5 marks)

6. A 28-year-old woman consulted her physician with complaints of tiredness, weight gain, decreased frequency of bowel movements, decline in memory and decreased tolerance to cold weather. On physical examination, her pulse rate was found to be 58 beats per minute and her blood pressure was 108/78 mm Hg. The physician noticed a lump on the anterior side of her neck. He also observed that she had a slightly puffy face and her skin had a yellowish tint.

6A. Name the endocrine disorder in the above case.

6B. Give the physiological basis for puffy face, yellowish skin, decrease in pulse rate and reduced bowel movements in the above case.

6C. Describe the regulation of secretion of the hormone involved in the above case.

(1+4+3 = 8 marks)

7A. Explain peristalsis in the small intestine.

7B. Describe the cellular mechanism of HCl secretion in stomach with the help of a diagram.

(2+3 = 5 marks)

8A. Mention two functions of Sertoli cells.

8B. Describe the regulation of testosterone secretion in the form of a flow chart.

(2+3 = 5 marks)

9. Describe the reabsorption of glucose from the renal tubules.

(5 marks)

10A. Describe any two properties of synapses.

10B. Draw a neat labeled diagram of the dorsal column pathway.

(4+3 = 7 marks)

11. Name any two refractory errors of eye. With the help of line diagram, describe the cause and correction of each.

(1+4 = 5 marks)