



FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA  
SECOND EXAMINATION FOR MEDICAL DEGREES  
PHYSIOLOGY PAPER II

Time: THREE HOURS

Answer all FIVE questions

Answer EACH QUESTION in a SEPARATE BOOK

Use diagrams where necessary

JUNE 2020

1.

- 1.1 State the definition of shock. (10 marks)
- 1.2 Write **three (03)** causes for the hypovolaemic shock. (10 marks)
- 1.3 Write **three (03)** other types of shock. (10 marks)
- 1.4 Write **four (04)** clinical features of hypovolaemic shock. (10 marks)
- 1.5 Explain the rapid, neurally mediated, compensatory response to hypovolaemic shock. (30 marks)
- 1.6 Explain the compensatory mechanisms operating through the kidney in hypovolaemic shock. (30 marks)

2.

- 2.1 List **three (03)** motility patterns in the gastrointestinal tract during the fed state. (15 marks)
- 2.2 Describe peristalsis. (30 marks)
- 2.3 Describe the mechanisms that lead to the initiation of vomiting
- 2.3.1 after a rotatory movement. (15 marks)
- 2.3.2 in food poisoning. (15 marks)
- 2.3.3 in cancer patients receiving chemotherapy. (10 marks)
- 2.4 List **three (03)** mechanisms operate in the gastrointestinal tract, which help to prevent infections. (15 marks)

**3.**

3.1 What is the renal clearance of a substance? (5 marks)

**3.2**

3.2.1 Describe the mechanism of water absorption in the proximal tubule. (15 marks)

3.2.2 Describe the regulation and mechanisms of water absorption in the collecting duct. (20 marks)

3.3 Explain the physiological basis for using PAH to measure the renal blood flow. (25 marks)

3.4 Substance X is freely filtered in glomeruli but is not get absorbed or secreted in the renal tubule. At rest, the concentration of the substance X is 100mg/dL in the renal artery and 80mg/dL in the renal vein. Describe the change of the concentration of substance X in the renal vein if the renal arterial concentration of the substance X is increased to 200mg/dL. (Assume that GFR remains unchanged ) (35 marks)

**4.**

4.1 What is puberty? (15 marks)

4.2 Describe the mechanisms for the onset of puberty. (40 marks)

4.3 Explain the physiological basis for subfertility seen in some male athletes taking testosterone tablets. (45 marks)

**5.**

5.1 Describe the polysynaptic reflex using a diagram. (40 marks)

5.2 State **four (04)** heat losing mechanisms in the body. (10 marks)

5.3 Describe the reflexive mechanisms that occur in a healthy person when he or she is exposed to a warm environment. (25 marks)

5.4 Explain the Physiological basis for the development of hypertension in Conn syndrome. (25 marks)

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