Master Copy

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

MD (ANAESTHESIOLOGY) PART IB (BASIC SCIENCES) (RESCHEDULED) EXAMINATION – OCTOBER 2021

Date:- 16th October 2021 **Time:-** 9.30 a.m. – 12.30 p.m.

ESSAY PAPER

Answer two (02) questions from each part, marked A, B and C.
Answer each question in a separate book.
Each question carries equal marks.

PART A – PHARMACOLOGY

1.

1.1. List the different mechanisms for transport of drugs across a cell membrane. (10%)

1.2. Outline the factors that influence the rate of transfer of drugs across the placenta. (30%)

1.3. How do above factors affect the transfer of following drugs across the placenta?

1.3.1. Midazolam (05%)

1.3.2. Glycopyrrolate (05%)

1.3.3. Ropivacaine (05%)

1.4. Write the mechanism of action and clinical uses of midazolam. (15%)

1.5. What are the main advantages of midazolam when compared to diazepam? Explain with reasons. (30%)

Contd……/2-

2.

2.1. Outline the factors which affect the speed of onset of neuromuscular blocking drugs. (30%)

2.2. Explain the mechanisms of spontaneous recovery from neuromuscular blockade of following drugs.

2.2.1. Suxamethonium (10%)

2.2.2. Atracurium (10%)

2.3.

2.3.1. What groups of drugs could be used to accelerate the recovery from rocuronium ? Give an example for each. (10%)

2.3.2. Outline the

(a) mode of action (25%)

(b) adverse effects (15%)
of above mentioned drugs in 2.3.1.

3.

3.1. Outline the mechanism of action and clinical uses of

3.1.1. Pregabalin (15%)

3.1.2. Clonidine (15%)

3.2. Explain the following

3.2.1. Mechanism of action of Adrenaline in treating anaphylaxis. (25%)

3.2.2. Levobupivacaine is a safer local anaesthetic than Bupivacaine. (15%)

3.3.

3.3.1. Outline the mechanism of action of unfractionated heparin. (20%)

3.3.2. What are the adverse effects of the above drug? (10%)

Contd...../3-

PART B - PHYSIOLOGY

1.

1.1. Outline the distribution of body water in a young adult weighing 70kg. (10%)

1.2. List four (04) important cations in the body stating their normal concentration in plasma. (10%)

1.3. Draw and explain the forces acting across the capillary endothelium. (35%)

1.4. Outline the new theory based on the revised Starling equation. (20%)

1.5. Outline the physiological basis of

1.5.1. Alveoli being kept dry. (15%)

1.5.2. Filtration in the glomerular capillaries. (10%)

2. A young healthy patient is awaiting surgery for a deep cut injury to the lower limb.

2.1. Outline the pathway of the neuro-endocrine response initiated by the pain in this patient. (30%)

2.2. Outline the actions of 4 main hormones released during this response. (30%)

2.3. Briefly explain the mechanisms which operate in the kidney to maintain the Glomerular Filtration Rate within normal range in this patient. (40%)

3.

3.1. Draw the oxygen cascade. (10%)

3.2. Outline the reasons for reduction in partial pressure at each level of the cascade. (30%)

3.3. Explain the causes of hypoxic hypoxia. (40%)

3.4. Explain the physiological basis for the following statement "Hypoxia caused by a 50% shunt cannot be completely eliminated by inspiring 100% O_2". (20%)

Contd...../4-

PART C – PHYSICS, CLINICAL MEASUREMENT AND CLINICAL CHEMISTRY

1.

1.1. Draw and label the basic components of a TEC 7 vaporizer. (40%)

1.2. Briefly describe the physical principles involved in its temperature compensation. (40%)

1.3. How does desflurane vaporizer (TEC 6) differ from TEC 7 vaporizer? (20%)

2.

2.1. Draw a labeled diagram of parts of the infra-red carbon-dioxide analyzer. (20%)

2.2. Briefly describe the physical principle used in this device. (30%)

2.3. Briefly explain the errors that can be seen with this analyzer and how they can be rectified. (30%)

2.4. List the advantages and disadvantages of side stream and main stream devices of end-tidal carbon-dioxide measurement. (20%)

3. Write short notes on the following-

3.1. Physical principles of the defibrillator. (40%)

3.2. Physical principle of single stage pressure reducing valve using a diagram. (30%)

3.3. Damping in relation to the arterial wave form. (30%)