



THE COLLEGES OF MEDICINE OF SOUTH AFRICA

Incorporated Association not for gain
Reg No 1955/000003/08

Part I Examination for the Fellowship of the
College of Emergency Medicine of South Africa

24 August 2010

Paper I(a)

Anatomy

(2 hours)

All questions to be answered. Each question is to be answered in a separate book (or books if more than one is required for the answer)

- 1 a) Write short notes on the anatomy of the pericardium under the following headings
 - i) Layers. (3)
 - ii) Anatomical relations. (4)
 - iii) Arterial supply. (3)
 - iv) Nerve supply. (2)
 - b) Write short notes on the venous drainage of the heart. (5)
 - c) Write short notes on the collateral ligaments of the ankle joint. (8)
- [25]
- 2 a) With the aid of a diagram, name the fascial compartments of the leg below the knee, including the nerves and arteries in each compartment. (10)
 - b) Name the structures in the hand supplied by the median nerve (sensory and motor). (5)
 - c) Tabulate all the muscles affecting movements of the eyeball, their respective innervation and the main action of each muscle. (10)
- [25]
- 3 a) Describe the anatomy of the ligamentous structures of the wrist. (10)
 - b) Describe the anatomy of the flexor tendons in the wrist and hand. (10)
 - c) Describe the function of the interosseous muscles in the hand. (5)
- [25]
- 4 Using a diagram, write short notes on the following
 - a) The anatomy of an open book pelvic fracture, including relevant vessels, nerves and ligaments. (10)
 - b) The neuro-anatomy relating to
 - i) Central cord syndrome. (8)
 - ii) Facial nerve palsy. (7)
- [25]



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Paper II(a)

Pathology

(2 hours)

All questions to be answered. Each question is to be answered in a separate book (or books if more than one is required for the answer)

- 1 a) Discuss the differences between the following, providing examples to illustrate your explanation
i) Primary and secondary brain injury. (7)
ii) Primary and secondary immunodeficiency. (6)
b) Discuss acute renal failure under the following headings
i) Aetiology. (6)
ii) The 3 phases of the clinical course of acute renal failure. (3)
iii) Indications for dialysis. (3)
[25]
- 2 a) Discuss the pathology of graft-versus-host disease including the differences between acute and chronic graft-versus-host disease. (8)
b) Explain the pathological differences between spinal and neurogenic shock. (8)
c) Describe 3 different methods of autologous blood transfusions. (9)
[25]
- 3 a) Discuss the aetiology and pathophysiology of pre-, intra-, and post-hepatic jaundice. (15)
b) Discuss the congenital and acquired causes of thrombophilia. (10)
[25]
- 4 Write short notes on the following
a) Peptic ulcer formation (as it precedes a ruptured ulcer with severe haematemesis). (5)
b) Osteoporotic hip fracture. (5)
c) Thyroid hyperplasia (resulting in an acute hyperthyroid state). (5)
d) Diabetic retinal changes. (5)
e) Adrenal cortical hyperplasia. (5)
[25]



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Paper III (a)

Physiology

(2 hours)

All questions to be answered. Each question is to be answered in a separate book (or books if more than one is required for the answer)

- 1 Regarding excitable tissues
 - a) Write short notes on axonal transport mechanisms within neurons. (7)
 - b) With the aid of a diagram, explain the molecular basis of muscle contraction. (10)
 - c) Discuss the location and function of the various glial cells that support neurons in the peripheral and central nervous systems (8)[25]

- 2 A 17-year-old male patient is brought into the emergency department with a history of confusion. His tympanic temperature is 39.5° centigrade
 - a) What are the possible causes of an elevated body temperature? (5)
 - b) Write short notes on the mechanisms for temperature homeostasis to control hyperthermia in the human adult. (10)
 - c) Describe the physiology of fever. (10)[25]

- 3
 - a) Describe the physiological mechanisms for the production and clearance of lactate. (10)
 - b) Draw the oxygen-haemoglobin dissociation curve, and explain how the difference in the physiological conditions in a capillary in the alveolus and in a capillary in an exercising muscle influence the curve to optimise oxygen delivery to the working tissues. (15)[25]

- 4 In the context of adrenal function, write short notes on
 - a) How pheochromocytoma affects blood pressure. (5)
 - b) Comparing cortisol with synthetic steroids. (5)
 - c) Shock due to adrenal insufficiency. (5)
 - d) Cushing's syndrome. (5)
 - e) The adrenal response to haemorrhagic shock. (5)[25]



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Paper IV(a)

Pharmacology

(2 hours)

All questions to be answered. Each question is to be answered in a separate book (or books if more than one is required for the answer)

- 1 a) Children and neonates often react differently to adults with regard to the administration of drugs
- i) Discuss why this may be the case. (6)
 - ii) Give 3 examples of drugs that you would avoid giving to paediatric patients and include the reason for your caution in prescribing the drug. (6)
- b) Compare Angiotensin II receptor antagonists with Angiotensin-converting enzyme inhibitors with regard to
- i) Indications for use. (3)
 - ii) Mechanism of action. (4)
 - iii) Side effect profile. (6)
- [25]
- 2 Describe one regime of antiretroviral agents that is used for post-exposure prophylaxis after possible contact with the Human Immunodeficiency Virus (HIV) and describe the mechanism of action of each of the component agents. (10)
- a) Describe what is meant by the "half-life" of a drug. How does this relate to its duration of action? (5)
 - b) What is the difference between zero-order kinetics and first-order kinetics? (3)
 - c) Draw a diagram of the arachidonic acid metabolism pathway and indicate at what level the pathway is inhibited by glucocorticosteroid agents, non-steroidal anti-inflammatory agents and leukotriene antagonist agents. (7)
- [25]
- 3 a) A patient presents to your emergency department with re-entrant supraventricular tachycardia. His condition is stable.
- i) Name the most appropriate drug to convert this rhythm, and detail the technique of administration. (5)
 - ii) List five factors that may influence the dose of this drug. (5)
 - iii) List the most significant side effects of this drug. (5)
- b) Write short notes on the pharmacological management of
- i) Tricyclic antidepressant overdose. (5)
 - ii) Beta blocker overdose. (5)
- [25]
- 4 In the context of emergency department procedural sedation, construct a table for the following drugs, using the column headings as follows (i) Mechanism of action; (ii) Indications; (iii) Dose; (iv) Cardiovascular effects; (v) Other notable organ system effects:
- a) Ketamine. (8)
 - b) Etomidate. (5)
 - c) Midazolam. (5)
 - d) Propofol. (7)
- [25]