



THE COLLEGES OF MEDICINE OF SOUTH AFRICA

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

24 March 2009

Paper 1(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 With the aid of diagrams, describe the relevant neuro-anatomy in the following circumstances
- a) A hangman's fracture resulting in paralysis. (5)
 - b) Sensory damage following attempted relocation of a shoulder. (5)
 - c) A symptomatic detached retina. (5)
 - d) Vertigo following cold water syringed into the external auditory meatus. (5)
 - e) Drop foot in a case of neuro-syphilis. (5)
- [25]
- 2 a) Tabulate the actions and nerve supply of the ocular muscles (15)

Muscle	Actions on Eyeball	Nerve Supply

- a) Describe which bones make up which margins of the orbit. (5)
 - b) Name the arteries contributing to the circulus arteriosus (the Circle of Willis) in the brain. (5)
- [25]
- 3
- a) With the aid of a diagram, explain the arterial supply of the upper limb. (13)
 - b) Write short notes on venous access in the upper limb, noting the relevant anatomy of the major veins. (5)
 - c) Discuss deceleration injuries to the thoracic aorta, noting relevant anatomical considerations. (7)
- [25]

- 4 a) Draw and label a diagram indicating the 10 bronchopulmonary segments of the left and right lung. (10)
- b) Discuss the anatomical development of the following
- i) Branchial cyst. (3)
 - ii) Thyroglossal cyst. (4)
 - iii) Dermoid cyst. (4)
 - v) Cystic hygroma. (4)
- [25]



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Paper 2(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 In protecting emergency care personnel from infectious diseases, write short notes on the following
- a) A standard protocol for an emergency department receiving a patient with a pyrexia of unknown origin. (13)
 - b) The management of a suspected avian "flu case". (7)
 - c) Why a yellow fever vaccination may be required. (5)
- [25]
- 2
- a) What are the common causes of acute hypocortisolism? (5)
 - b) What is the effect of aldosterone on the kidney? (5)
 - c) What are the common characteristics of Graves' disease? (3)
 - d) You are looking for the causes of a patient's hypoglycaemia. Complete the following table, describing the expected effects of certain situations on the plasma insulin and C-peptide levels. (12)

Hypoglycaemia due to	Effect on plasma insulin	Effect on plasma C-peptide
Insulin administration		
Insulinoma		
Sulphonylurea administration		
Alcohol		
Non-pancreatic non-insulin-secreting tumor		
Pituitary or adrenal failure		

[25]

- 3
- a) Discuss the pathology of peritonitis, including local and systematic complications. (8)
 - b) Write short notes on inflammatory bowel disease. (7)
 - c) Using a table to help, discuss the different types of jaundice. Include key clinical and biochemical features. (10)

[25]

- 4 a) i) Explain the concept of apoptosis. (5)
ii) What factors are known to affect apoptosis? (5)
- b) i) Name any 5 common cytokines. (5)
ii) Discuss the role that each of the cytokines mentioned above plays in wound healing. (5)
- c) Name 5 oncogenic viruses and the neoplasm that it is associated with. (5)
- [25]



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Paper 3(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 Emergency medicine is often practised in the aviation environment. This can affect patients, equipment and aero-medical crew. Write short notes on:
- a) how increases in altitude affect the cardiovascular system (10)
 - b) how increases in altitude affect structures filled with air (4)
 - c) how increases in altitude contribute to hypoxia (5)
 - d) how motion sickness is caused. (6)
- [25]
- 2 a) In an emergency situation glucagon can be given to a hypoglycaemic patient as a temporary measure
- i) Where is glucagon produced in the body? (1)
 - ii) Explain why giving glucagon to a hypoglycaemic patient helps? (4)
- b) A baby is severely dehydrated due to diarrhoea. Draw a flow diagram showing the homeostatic mechanisms which prevent further loss of sodium and water through the kidneys. (20)
- [25]
- 3 a) Explain the spinal control of walking. (7)
- b) Write short notes on the control of calcium homeostasis. (7)
- c) Explain the production, mechanism of action, and distal organ effects of cortisol. (11)
- [25]

- 4 Discuss the basic mechanisms that control respiration, using the following headings
- a) Medullary control. (9)
 - b) Pontine control. (5)
 - c) Cortical control. (2)
 - d) Peripheral chemoreceptors. (5)
 - e) J – receptors. (2)
 - f) Baroreceptors. (2)
- [25]



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Paper 4(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 In the pharmacological management of drug overdoses, write short notes on:
- a) the mechanism of action of N-acetyl cysteine when treating paracetamol overdose (4)
 - b) the theoretical characteristics of an antidote for a cocaine overdose (5)
 - c) the effectiveness and mechanism of action of activated charcoal (5)
 - d) the theory of pharmacological manipulation of urinary pH to facilitate the excretion of certain drugs (5)
 - e) drugs used in the management of acute alcohol toxicity. (6)
- [25]
- 2 a) You have to treat patients with community acquired pneumonia on an outpatient basis. According to common practice on the management of community acquired pneumonia in South Africa, indicate which antibiotics should be chosen in the following cases
- i) 21-year-old male (otherwise healthy) living in a university residence.
 - ii) 12-year-old child (no comorbidities) living with his parents, recently on amoxicillin.
 - iii) 65-year-old female with hypertension.
- (10)
- b) List the adverse effects of scoline. (7)
- c) What influence do the following have on the effects of adenosine?
- i) Patient took theophylline.
 - ii) Patient is on carbamazepine.
 - iii) Patient drank 3 cups of coffee.
 - iv) Patient had a heart transplant.
- (8)

3 With regard to elevated blood pressure

- a) Explain the renin-angiotensin system. (5)
 - b) Discuss the administration, mechanism of action, indications and effects of glyceryl trinitrate (GTN). (8)
 - c) Explain the mechanism of action of verapamil. (2)
 - d) Write short notes on hydralazine. (5)
 - e) Write short notes on esmolol. (5)
- [25]

4 A child presents to your emergency department in status epilepticus. Indicate the dosage and any relevant special precautions regarding the following anticonvulsant therapies you might consider using for this child

- a) Diazepam. (4)
 - b) Lorazepam. (3)
 - c) Clonazepam . (3)
 - d) Valproate. (3)
 - e) Phenytoin. (4)
 - f) Phenobarbitone. (4)
 - g) Thiopentone. (4)
- [25]