



JOHANNESBURG OFFICE

EXAMINATIONS & CREDENTIALS

BLUEPRINT FOR FC PATH(SA) HAEM PART 1 EXAMINATION:

1.0 WRITTEN EXAMINATION PAPERS

1.1 Candidates must get a combined aggregate of 50% or more for Paper 1 and Paper 2 in order to pass the examination

- Both Paper 1 and Paper 2 will consist of single best answer multiple choice questions.
- Both Papers 1 and Paper 2 will cover all the required knowledge areas outlined in sections 1.2 and 1.3 .
- There is *no practical examination* for Part 1 candidates.

1.2 Haematological physiology and immunology

Candidates must demonstrate in depth knowledge of all aspects of the physiology of the blood, blood forming organs, monocyte macrophage system and haemostasis and the appropriate clinical correlates.

The following topics will be examined on

1.2.1 Structure of the bone marrow, spleen, thymus and lymph nodes

1.2.2 Haematopoietic stem cells, progenitor cells, and cytokines

1.2.3 Cell signalling

1.2.4 Adhesion molecules

1.2.5 Erythropoiesis

1.2.5.1 Structure and function of the red cell, red cell life span

1.2.5.2 Red cell membrane

1.2.5.3 Red cell metabolism; energy, enzymes, organelle function

1.2.5.4 Iron metabolism

1.2.5.5 Haem synthesis and porphyrin metabolism

1.2.5.6 The haemoglobin molecule

1.2.5.7 Red cell lifespan and turnover, bilirubin metabolism, mechanisms for metabolism of circulating free haemoglobin

1.2.5.8 Vitamin B12 and folate metabolism

1.2.6 Granulopoiesis

1.2.6.1 Neutrophil structure and function

1.2.6.2 Eosinophil structure and function

1.2.6.3 Basophil and mast cell structure and function

1.2.7 Haemostasis

1.2.7.1 The coagulation cascade and the cell-based model

1.2.7.2 Regulators of coagulation

1.2.7.3 All coagulation factors notably Factors VIII and IX

1.2.7.4 Von Willebrand factor

1.2.7.5 Vitamin K metabolism and vitamin K dependent clotting factors

1.2.7.6 Fibrinogen and fibrinolysis

1.2.7.7 Regulators of fibrinolysis

1.2.7.8 Platelets: megakaryopoiesis, thrombopoiesis, structure, activity and function

1.2.8 Endothelium structure and function

1.2.9 Pregnancy, intrauterine and neonatal haematology

1.2.10 Basics concepts of angiogenesis

1.2.11 Innate immunity

1.2.12 Adaptive immunity

1.2.13 Inflammation

- 1.2.14 Immunogens and antigens
- 1.2.15 Antibody structure and function
- 1.2.16 Genetic basis of antibody structure
- 1.2.17 Antigen-antibody interactions immune assays and experimental systems
- 1.2.18 Biology of the B lymphocyte
- 1.2.19 Biology of the T lymphocyte
- 1.2.20 Activation and function of T Cells
- 1.2.21 Cytokines
- 1.2.22 Tolerance and autoimmunity
- 1.2.23 Complement
- 1.2.24 Hypersensitivity
- 1.2.25 Major histocompatibility complex
- 1.2.26 Basic concepts of transplantation
- 1.2.27 Basic concepts of tumour immunology
- 1.2.28 Basic concepts of resistance and immunization to infectious diseases
- 1.2.29 Basic concepts of the pathogenesis of HIV and other viruses

1.3 Immunohaematology and molecular biology

Candidates must demonstrate knowledge of clinically significant blood group antigens and antibodies, and their clinical correlates, and molecular biology.

The following topics will be examined on

1.3.1 Immunohaematology

- 1.3.1.1 Blood group antigens with emphasis on the most clinically significant
- 1.3.1.2 Blood group antibodies with emphasis on the most clinically significant
- 1.3.1.3 Basic blood group serology and techniques in immunohaematology.

1.3.2 Molecular biology

- 1.3.2.1 Genome and epigenome
- 1.3.2.2 Gene organisation
- 1.3.2.3 Gene structure, expression and regulation
- 1.3.2.4 RNA interference and microRNA
- 1.3.2.5 Chromosomes: structure and function
- 1.3.2.6 Cell signalling pathways
- 1.3.2.7 Mitosis and meiosis
- 1.3.2.8 Cell cycle
- 1.3.2.9 Apoptosis
- 1.3.2.10 Aging
- 1.3.2.11 Mendelian inheritance
- 1.3.2.12 Mutations
 - 1.3.2.12.1 Single gene mutations
 - 1.3.2.12.2 Structural abnormalities
- 1.3.2.13 Non-classical inheritance
- 1.3.2.14 Basic knowledge of the laboratory methods in molecular biology
 - 1.3.2.14.1 PCR
 - 1.3.2.14.2 Quantitative PCR
 - 1.3.2.14.3 Karyotyping
 - 1.3.2.14.4 FISH
 - 1.3.2.14.5 Sanger sequencing
 - 1.3.2.14.6 Microarrays
 - 1.3.2.14.7 High throughput sequencing
- 1.3.2.15 Basic concepts of oncogenesis
 - 1.3.2.15.1 Self-sufficiency that drives proliferation
 - 1.3.2.15.2 Insensitivity to growth-inhibition
 - 1.3.2.15.3 Evasion of apoptosis
 - 1.3.2.15.4 Defects in genetic repair mechanisms
- 1.3.2.16 Basic concepts of pharmacogenetics
- 1.3.2.17 Basic concepts of gene therapy