FCA(SA) Part I - Blueprints

The blueprints are designed to provide a listing of the major content areas and expected learning emphasis for candidates preparing to write the primary examination.

The primary or FCA 1 examination is the first of two examinations required in successful completion of the Fellowship in Anaesthesia (FCA (SA)) of the Colleges of Medicine of South Africa.

The FCA 1 syllabus emphasises knowledge of basic sciences as they apply to the practice of clinical anaesthesia, combining domains of knowledge, understanding, application and analysis of basic science problems. It is presented as three subjects:

A. Physics and Clinical Measurement in Anaesthesia
B. Pharmacology
B. Physiology and Chemical Pathology.

Each subject is examined as two papers, a single best answer (SBA) format paper of 120 questions, and a short answer question (SAQ) format paper consisting of 20 questions. All the content areas can be examined in any of the two papers.

Although the three subjects are linked in the basic sciences learning process, each must be passed individually within two examination sittings (see FCA regulations).

The weighting of questions set in each subject will take into account the following:

1**. Impact**: This refers to implications for safety and life preservation in the practice of Anaesthesia or the likelihood of harm to patients if the subject is not known, or understood well.
This is graded 1-3 from least impact to life threatening.

2. **Frequency**: How often the problem is encountered in clinical practice,
Graded 1-3 from least frequent to most frequent.

3. **Combined score:** Obtained by adding the frequency and impact, will determine the depth of knowledge, and the emphasis required of the candidate on that subject.

It should be noted that all the content areas are important; however those with the highest combined score are of great importance and will receive the most emphasis on the examination.

	FREQUENCY	IMPACT	COMBINED
A. PHYSICS AND CLINICAL MEASUREMENT			
A.1. Basic Physics: 30 % of the paper			
Basics units of measurements	2	2	4
Work, energy and power	2	2	4
Elementary mathematics relevant to anaesthesia (natural exponential functions, sine waves etc.	3	3	6
The gas laws	3	3	6
Manufacture, storage and supply of anaesthesia gases	3	3	6
Vapour pressure, latent heat, and vaporisers	3	3	6
Diffusion and osmosis	2	3	5
Solubility	3	2	5
Humidity and humidification	3	3	6
Heat, thermometry	1	2	3
Fires and explosions	1	3	4
Basic electricity, electrical safety, diathermy	3	3	6
Bernoulli effect; Coanda effect and anaesthetic applications	1	3	4
The electromagnetic spectrum and its applications	3	3	6
Ultrasound and the Doppler principle	3	3	6
Transducers, damping coefficient, natural frequency	2	3	5
A.2. Clinical Measurement: 30 % of the paper			
Recording of display of biological potential (ECG, EEG, EMG evoked potentials etc.)	3	2	5
Electrodes (pH, PCO2, and PO2	2	2	4
Measurement of flow and volume	3	3	6
Measurement of pressure, non-invasive and invasive transducers	3	3	6
Measurement of electrolytes	2	1	3
Gas and vapour analysis	3	3	6
Tests of Organ Function			
Respiratory system	3	3	6
Cardiovascular system	3	3	6
Central nervous system	2	3	5
Coagulation	2	3	5
Neuromuscular junction and blockade	3	3	6
A.3.Anaesthesia Related Apparatus: 35% of the paper			
The anaesthesia machine	3	3	6
Breathing systems	3	3	6
Ventilators	3	3	6
Filters	3	3	6
Monitors	3	3	6
Electrocardiograph machine	2	2	4
Cardiac defibrillators	3	3	6
Pacemakers	2	3	5
The effect of barometric pressure on functioning apparatus	2	3	5

A.4. Basic Statistics: 15% of the paper			
Basic research methodology	2	2	4
Descriptive Statistic	2	2	4
Distribution	2	2	4
Statistical Tests	2	2	4
Comparison	2	2	4
B. PHARMACOLOGY			
B.1. General Principles 30% of the paper			
Principles of receptor kinetics, pharmacokinetics and pharmacodynamics, drug interactions	2	3	5
B.2. Systematic Pharmacology 70% of the paper			
Inhalational Anaesthetics	3	3	6
Intravenous Anaesthetics	3	3	6
Drugs blocking nerve conduction	3	3	6
Drugs blocking and stimulating autonomic pathways	3	3	6
Drugs affecting neuromuscular junction and cholinergic receptors	3	3	6
Histamine and antagonists; serotonin and antagonists	2	3	5
Drugs used in relief of acute and chronic pain	3	3	6
Drugs producing anxiolysis, sedation, neuroleptics and amnesia	3	3	6
Drugs used in treatment of epilepsy, Parkinsons,depression, mania	1	3	4
Drugs affecting voluntary and involuntary muscle tone	2	3	5
Drugs influencing the conduction, contractility, rhythm and myocardial oxygen supply and demand balance of the heart	2	3	5
Drugs influencing blood pressure	3	3	6
Drugs influencing homeostasis	2	2	4
Oxytocic drugs	2	3	5
Drugs stimulating and blocking hormones	2	2	4
Drugs influencing thermoregulation	1	2	3
Antibiotics	3	3	6
Chemotherapeutic drugs and immunosuppressive agents	1	1	2
Diuretics	2	2	4
Antiemetic drugs	2	2	4
Anti-diarrhoeal drugs	1	1	2
Drugs modifying gastric pH, gastric aspirate volume, emptying, and GIT smooth muscle tone	3	2	5
Contrast media	2	3	5
Intravenous Colloids	3	3	6
Pharmacogenetics related to Anaesthesia	2	2	4
C. PHYSIOLOGY & CHEMICAL PATHOLOGY			
C.1. Basic Physiology principle 15%			
Cell physiology	2	3	5
Cell membrane; Nucleus DNA & genes; Mitosis and Meiosis; Cytoplasm and organelles; Cell metabolism and energy production; Protein synthesis; Cell signaling and Cell death.			
Body fluids	3	3	6

Composition, Body fluid compartments, Units for measuring solutes, Movement of fluids and solutes between compartments, pH and buffers, Electrolytes, Electrical potentials			
C.2. Physiology and pathophysiology of Body Systems 85% of the paper			
Blood – RBC, WCC, Platelets, Coagulation, Immunology, Inflammation.	3	3	6
Excitable tissues - nervous system, muscle, and neuromuscular junction physiology.	3	3	6
CNS – Brain, Spinal cord , Cranial nerves, Sensory and Motor system, Reflexes, Autonomic nervous system, Special senses	3	3	6
Cardiovascular system	3	3	6
Respiratory system	3	3	6
Renal and urogenital system	3	3	6
Acid -base physiology	3	3	6
Gastro-intestinal system, Intermediate metabolism and Nutrition	3	3	6
Endocrine system receptors and second messengers	2	3	5
Reproductive system and pregnancy	3	3	6
Neonatal physiology	3	3	6
Physiology of aging	2	3	5
Hepatobiliary pancreatic system	3	3	6
Surgical stress response	3	3	6
Skin and skeletal system	2	2	4

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