REGULATIONS

FOR ADMISSION TO THE FELLOWSHIP OF THE

COLLEGE OF ANAESTHETISTS OF SOUTH AFRICA

FCA(SA)

1.0 COMPONENTS

1.1 The examination comprises two parts: Part I and Part II.

1.2 The Part II must be passed within six years of passing the Part I examination.

2.0 PURPOSE OF ASSESSMENT

This qualification forms part of the process to accredit medical practitioners as Anaesthesiologists (Specialist Anaesthetists).

3.0 ADMISSION TO THE EXAMINATION

3.1 The CMSA Senate, through its Examinations and Credentials Committee, will review all applications for admission to the examination and may also review the professional and ethical standing of candidates.

3.2 Part I

A candidate may be admitted to Part I of the examination on having:

3.2.1 a qualification to practice medicine that is registered or registrable as a Medical Practitioner with the Health Professions Council of South Africa (HPCSA)

3.3 Part II

A candidate may be admitted to the Part II examination:

3.3.1 after passing the FCA (SA) Part I examination OR

3.3.2 after passing the MMed (Anaes) Part 1 from a South African University OR

3.3.3 after having been exempted by College of Anaesthetists from the primary examination AND

3.3.4 on production of evidence of:

3.3.4.1 having held a fulltime appointment as a registrar in an academic Department of Anaesthesiology for at least three years. (Only one year may be spent in a satellite training hospital) AND

3.3.4.2 having been assigned for three months of the above period to an accredited Intensive Care Unit on a fulltime basis AND

3.3.4.3 having successfully completed a Portfolio of Learning for the training period as evidenced by a completed declaration from the head of the academic department.
4.0 FORMAT OF THE EXAMINATION

4.1 PART I

4.1.1 The examination consists of the following three subjects:

i) **Physiology and Chemical Pathology** with emphasis on those general principles relevant to anaesthesiology and analgesia.

ii) **Pharmacology** with emphasis on those general principles relevant to anaesthesiology and analgesia.

iii) **Physics and the Principles of Clinical Measurement and Data Management** as they relate to anaesthetic practice.

4.1.2 Candidates must write ALL of the subjects listed in 4.1.1 at one single sitting of the examinations of the Colleges of Medicine of South Africa.

4.1.3 The examination comprises:

4.1.3.1 a three-hour written paper in each of the subjects listed in 4.1.1 comprising a minimum of one hundred and twenty multiple choice/single best answer questions with a minimum of three choices per question.

AND

4.1.3.2 a three-hour written paper in each of the subjects listed in 4.1.1, comprising a minimum of twenty questions requiring short answers.

4.1.4 Criteria for passing the Part I examination

4.1.4.1 Marks for the written examination will be aggregated, analysed and the pass mark will be determined by the Cohen method of standard setting. To ensure a higher probability of a true pass, an additional upward adjustment using multiples of the Standard Error of Measurement (a marker of reliability of the examination) will be made to the Cohen pass mark to determine the final pass mark (standard).

4.1.4.2 In order to pass each subject a candidate must achieve an average mark equal to or greater than the passing score as determined in 4.1.4.1. for both papers combined in each of the subjects.

4.1.4.3 A candidate who passes all three subjects in terms of rule 4.1.4.2. will have passed the primary examination.

4.1.4.4 A candidate who passes any subject/s in terms of 4.1.4.2, may attempt the failed subject/s at the next consecutive examination of the CMSA.

4.1.4.5 A candidate who fails the remaining subject/s at the next consecutive examination will be deemed to have failed the FCA(SA) Part I examination. Such a candidate will need to repeat ALL THREE subjects at a later examination.

4.2 PART II

4.2.1 Components

The examination comprises 3 components:

4.2.1.1 **Written**

i) ONE written paper of THREE hours comprising a minimum of one hundred and twenty multiple choice/single best answer questions with a minimum of three choices per question.

ii) ONE written paper of THREE hours comprising a minimum of TWENTY short answer questions.

iii) ONE written paper of THREE hours comprising a minimum of TWENTY questions requiring short answers with an emphasis on data interpretation.

4.2.1.2 an **Oral** examination consisting of four parts

4.2.1.3 a **Clinical** examination consisting of

i) a minimum of TWO 'paper' patients

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1 New Format for the Written Examinations
2 New Format for the Clinical Examinations
4.2.2 **Weighting of the components of the examination for the FCA (SA) Part II**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper 1</td>
<td>18%</td>
</tr>
<tr>
<td>Paper 2</td>
<td>18%</td>
</tr>
<tr>
<td>Paper 3</td>
<td>18%</td>
</tr>
<tr>
<td>Oral</td>
<td>20%</td>
</tr>
<tr>
<td>Clinical</td>
<td>26%</td>
</tr>
</tbody>
</table>

4.2.3 **Criteria for entry to the oral and clinical examination:**

Marks for the written examination will be aggregated, analysed and the pass mark will be determined by the Cohen method of standard setting. To ensure a higher probability of a true pass, multiples of the Standard Error of Measurement (a marker of reliability of the examination) will be added to the Cohen pass mark to determine the final pass mark (standard) which will be used. Candidates must obtain an average mark greater than or equal to the final passing score, as explained in this section, for all three written papers combined, to pass the written component of the examination.

4.2.4 **Minimum Criteria for passing the Part II examination**

4.2.4.1 Entry into the oral/clinical section of the examination as in 4.2.3 above

4.2.4.2. Marks for the whole examination will be aggregated, analysed and the pass mark will be determined by the Cohen method of standard setting. To ensure a higher probability of a true pass, addition of multiples of the Standard Error of Measurement (a marker of reliability of the examination) will be made to the Cohen pass mark to determine the final pass mark (standard) which will be used. Candidates must obtain a pass for the written, clinicals and orals combined, to pass the examination overall.

4.2.4.3. If a candidate passes the written component of the FCA (SA) Part II examination, but fails the oral and clinical component of the exam, they will be permitted to redo the oral and clinical component once only, at the next set of examinations, without having to rewrite the written component. This carry over of the written component results will only be permitted once, and only for the oral and clinical examination directly following the failed examination.

The written and oral/clinical components data from a candidate sitting only the oral/clinical component of the current FCA Part II examination cycle, will not form part of the standard setting and reliability calculations for the current examination cycle. Such candidates’ data, however, will be judged against the final calculated standard (pass mark) of the current FCA Part II examination cycle, as calculated with the data from the candidates who sit the entire examination for the first time.
5.0 ADMISSION AS A FELLOW

5.1 Only candidates who have completed training in a CMSA recognised registrar post may be awarded a fellowship if successful in the examination.

5.2 Candidates who have written the examination as a prerequisite from the HPCSA for inclusion on the specialist register are not eligible to be awarded a Fellowship but will be sent a letter confirming their success in the examinations.

All other candidates will be asked to sign a declaration as below:

I, the undersigned, …………………………………………………………… do solemnly and sincerely declare

that while a member of the CMSA I will at all times do all within my power to promote the objects of the CMSA and uphold the dignity of the CMSA and its members

that I will observe the provisions of the Memorandum and Articles of Association, By-laws, Regulations and Code of Ethics of the CMSA as in force from time to time

that I will obey every lawful summons issued by order of the Senate of the said CMSA, having no reasonable excuse to the contrary

and I make this solemn declaration faithfully promising to adhere to its terms

Signed at ………………………………… this …………………….. day of

……………………………………………………… 20 ………..

Signature ……………………………

Witness ……………………………………………………

(who must be a Founder, Associate Founder, Fellow, Member, Diplomate or Commissioner of Oaths)

5.2 two-thirds majority of members of the CMSA Senate present at the relevant meeting shall be necessary for the award to any candidate of a Fellowship

5.3 Fellows shall be entitled to the appropriate form of certificate under the seal of the CMSA

5.4 In the event of a candidate not being awarded the Fellowship (after having passed the examination) the examination fee shall be refunded in full excluding HPCSA candidates who are not entitled to a Fellowship

5.5 The first annual subscription is due one year after registration (statements are rendered annually

JOHANNESBURG
JUNE 2017
APPENDIX A

The following information is intended as a guide to candidates, and indicates the general scope of the examination in the three papers for the Part I examination.

PHYSICS and the PRINCIPLES of CLINICAL MEASUREMENT

1.0 PHYSICS

1.1 Basic units of measurement
1.2 Work, energy and power
1.3 Elementary mathematics relevant to anaesthesia (natural exponential functions, sine waves etc)
1.4 The gas laws
1.5 Manufacture, storage and supply of anaesthesia gases
1.6 Vapour pressure, latent heat, and vaporisers
1.7 Diffusion and osmosis
1.8 Solubility
1.9 Humidity and humidification
1.10 Heat, thermometry
1.11 Fires and explosions
1.12 Basic electricity, electrical safety, diathermy
1.13 Bernouli effect; Coander effect and anaesthetic applications
1.14 The electromagnetic spectrum and its application
1.15 Ultrasound and the Doppler principle
1.16 Transducers, damping coefficient, natural frequency

2.0 CLINICAL MEASUREMENT

2.1 General:
  2.1.1 Units of measurement
  2.1.2 Recording of display of biological potentials [ECG, EEG, EMG evoked potentials etc]
  2.1.3 Electrodes [pH, PCO2, and PO2]
  2.1.4 Measurement of flow and volume
  2.1.5 Measurement of pressure, non-invasive and invasive transducers, damping etc
  2.1.6 Measurement of electrolytes
  2.1.7 Gas and vapour analysis
  2.1.8 Tests of Organ Function:
      2.1.8.1 Respiratory system
      2.1.8.2 Cardiovascular system
      2.1.8.3 Central nervous systems
      2.1.8.4 Coagulation
      2.1.8.5 Neuromuscular junction and blockade
2.2 Anaesthesia Related Apparatus:
   2.2.1 The anaesthesia machine
   2.2.2 Breathing systems
   2.2.3 Ventilators
   2.2.4 Filters
   2.2.5 Monitors
   2.2.6 Electrocardiograph machine
   2.2.7 Cardiac defibrillators
   2.2.8 Pacemakers
   2.2.9 The effect of barometric pressure on functioning apparatus

2.3 Basic Statistics:
Candidates should understand the appropriate application of statistical tests to particular situations, but will
not be expected to be able to perform the necessary calculations. Statistics should be learnt as a background
for future research and to enable a candidate to evaluate the literature critically.
   2.3.1 Basic research methodology: Randomisation and sampling; Hypothesis testing; Types of error;
        Power analysis; Types of data; Accuracy, bias, precision.
   2.3.2 Descriptive Statistics: Types of distribution (Gaussian and non-Gaussian); Measures of central
tendency - mean, median and mode; Measure of dispersion - standard deviation, standard error of
        the mean; Methods of displaying data graphically - histograms etc; Percentiles.
   2.3.3 Distribution: Types of distribution; Standard deviation and standard error of the mean.
   2.3.4 Statistical Tests: Probability and p values; Confidence intervals; Hypothesis testing for
        significance; Degrees of freedom; One-tail and two-tail tests; Student’s T test; Analysis of
        variance; Chi-square test; Non-parametric tests (Wilcoxon, Mann-Whitney, Spearman); Odds
        ratios.
   2.3.5 Comparison: Correlation and regression; Altman and Bland.

PHARMACOLOGY

1.0 PRINCIPLES:
   1.1 General principles of pharmacology with particular attention to uptake, distribution, biotransformation and
       excretion of drugs and mechanism of drug action.

2.0 SYSTEMATIC PHARMACOLOGY:
This should include the pharmacology of:
   2.1 General principles of receptor kinetics, pharmacokinetics and pharmacodynamics
   2.2 Inhalational anaesthetic agents
   2.3 Intravenous anaesthetic agents
   2.4 Drugs blocking nerve conduction
   2.5 Drugs blocking and stimulating autonomic pathways
   2.6 Drugs affecting the neuromuscular junction and cholinergic receptors
   2.7 Histamine, histamine antagonists; serotonin and antagonists
   2.8 Drugs used in the relief of acute and chronic pain
   2.9 Drugs producing anxiolysis, sedation, neurolepsis and amnesia
   2.10 Drugs used in treatment of epilepsy, Parkinson’s disease, depression, mania
   2.11 Drugs affecting voluntary and involuntary muscle tone
   2.12 Drugs influencing the conduction, contractility, rhythm, and myocardial oxygen supply and demand balance
       of the heart
   2.13 Drugs influencing blood pressure
   2.14 Drugs influencing haemostasis
   2.15 Oxytoxic drugs
   2.16 Drugs simulating, stimulating or blocking hormones
   2.17 Drugs influencing thermoregulation
   2.18 Antibiotics, chemotherapeutic agents and immunosuppressive drugs (detailed knowledge not expected)
2.19 Diuretics
2.20 General principles of drug interactions
2.21 Anti-emetic and anti-diarrhoeal drugs
2.22 Drugs modifying gastric pH, volume of gastric aspirate, gastric emptying and gastrointestinal smooth muscle tone
2.23 Contrast media
2.24 Intravenous colloids
2.25 Pharmacogenetics related to anaesthesia

**PHYSIOLOGY and CHEMICAL PATHOLOGY**

The relevant chemical pathology under each section should be studied.

**1.0 BASIC ASPECTS**
1.1 Internal environment. Homeostasis. Control systems and mechanisms. The cell membrane. Intercellular and intracellular communication

**2.0 WATER AND ELECTROLYTES**
2.1 Body water. Osmolality. Osmolarity. Osmolar and anion gap
2.2 Sodium. Potassium. Magnesium. Calcium. Phosphate. Chloride
2.3 Water and electrolyte disturbances

**3.0 CELL PHYSIOLOGY**
3.1 Membranes. Membrane potentials. General cellular physiology
3.2 Basic genetics, genetic control of cellular activity and genetic diseases (e.g., Porphyria)

**4.0 BLOOD**

**5.0 INTERMEDIARY METABOLISM**
5.1 Carbohydrate metabolism; fat metabolism; protein metabolism - basic aspects. Aerobic and anaerobic metabolism. Energy metabolism

**6.0 EXCITABLE TISSUES - NERVOUS SYSTEM**
6.1 Action potential and graded responses. Membrane excitability
6.2 Neuromuscular transmission. Skeletal muscle physiology
6.3 Reflexes. Muscle tone
6.4 Basic function of spinal cord and brain
6.5 Synaptic transmission. Neurotransmitters
6.6 Sensory mechanisms - basic aspects
6.7 Physiology of pain
6.8 Body temperature
6.9 Motor function - basic aspects
6.10 Autonomic nervous system
6.11 Consciousness and sleep
6.12 Cerebral blood flow. Brain metabolism
6.13 Intracranial pressure. Cerebrospinal fluid - formation and flow
7.0 CARDIOVASCULAR SYSTEM
7.1 Transcapillary exchange. Oedema
7.2 Principles of blood flow. Compliance. Transmural pressures
7.3 Generation and conduction of the cardiac impulse. Common arrhythmias
7.4 Normal ECG
7.5 Cardiac cycle and cardiac sounds. Pressure changes in atria and ventricles
7.6 Cardiac output. Preload, afterload, contractility, the work of the heart
7.7 Blood pressure. Central venous and wedge pressures
7.8 Control of the circulation
7.9 Myocardial blood flow and metabolism
7.10 Pathophysiology of myocardial ischaemia, shock, hypertension, anaemia, and cardiac failure
7.11 The regulation of blood pressure
7.12 Tests of cardiac function

8.0 RESPIRATORY SYSTEM
8.1 Oxygen and carbon dioxide homeostasis
8.2 Pulmonary circulation. Transcapillary exchange. Pulmonary oedema
8.3 Characteristics of the respiratory centre
8.4 Pressures in the respiratory system
8.5 Lung volumes and capacities
8.6 Respiratory minute volume. Alveolar ventilation. Dead space
8.7 Respiratory muscle. Mechanism of spontaneous ventilation
8.8 Physiology of mechanical ventilation
8.9 Ventilation-perfusion relationships
8.10 Elasticity and compliance. Flow resistance. Work of breathing
8.11 Alveolar gas exchange
8.12 Gas transport to and from the tissues. Oxygen consumption and CO2 production
8.13 Effects of barometric pressure
8.14 Control of ventilation
8.15 Non-respiratory pulmonary function
8.16 Hypoxia and hypercarbia. Pathophysiology of respiration failure - basic aspects
8.17 Pulmonary function tests

9.0 URINARY SYSTEM
9.1 Glomerular filtration. Renal blood flow. Re-absorption and secretion
9.2 Handling of water, electrolytes and other substances
9.3 Dilution and concentration of urine. Countercurrent mechanisms
9.4 Plasma clearance. Renin-angiotensin mechanisms
9.5 Renal function tests

10.0 ACID-BASE PHYSIOLOGY
10.1 Henderson-Hasselbalch equation
10.2 Chemical buffers
10.3 Acidosis and alkalosis

11.0 NUTRITION AND GASTRO-INTESTINAL SYSTEM
11.1 Enteral and parenteral nutrition - basic aspects. The lower oesophageal sphincter
11.2 Gastro intestinal function and secretion. Vomiting and regurgitation
11.3 Liver function tests. Pathophysiology of jaundice.
11.4 Hormones of the gastrointestinal tract
12.0 ENDOCRINE SYSTEM
12.1 Hypothalamus
12.2 Pituitary
12.3 Thyroid
12.4 Adrenal gland
12.5 Pancreas including abnormalities of glucose metabolism
12.6 Calcium and phosphate homeostasis
12.7 Mode of action of hormones
12.8 Prostaglandins, leucotrienes, encephalins and endorphins
12.9 Endocrine function of other organs (kidney, lung etc)

13.0 REPRODUCTIVE SYSTEM AND PREGNANCY
13.1 Physiology of pregnancy
13.2 Fetal circulation and adaptations after birth
13.3 Placental function and transfer mechanisms

14.0 NEONATAL PHYSIOLOGY

15.0 TEMPERATURE REGULATION

16.0 BASIC IMMUNOLOGY
16.1 Body defence mechanisms, allergy and anaphylaxis

FCA(SA) PART I

RECOMMENDED READING LIST

All Three Subjects:
2. Annual ASA refresher course lecture notes
3. Relevant journal articles

Biochemistry:

Chempath:

Pharmacology:
8. SA medicines formulary.

Physics:…/
Physics:

Physiology:
APPENDIX B

The following information is intended as a guide to candidates, and indicates the general scope of the examination for the Part II examination. Candidates are referred to the DETAILED CURRICULUM on the CMSA website.

1.0 Recommended subjects to be covered in the FCA(SA) Part II examination:
   - The history, principles and practice of anaesthesiology and analgesia, including pre-operative evaluation and preparation and post-operative care
   - Clinical medicine and surgery related to the practice of anaesthesiology
   - The application of anatomy, pathology and pharmacology to the speciality of anaesthesiology
   - Principles of continuous learning and quality assurance

2.0 Anaesthesia for:
   - General surgery
   - Cardiac Surgery
   - Thoracic Surgery
   - Vascular Surgery
   - Orthopaedic Surgery
   - Otorhinolaryngology Surgery
   - Ophthalmological Surgery
   - Plastic and Maxillofacial Surgery
   - Gynaecological Surgery
   - Urological Surgery
   - Interventional Radiology
   - Transplant Surgery
   - Neurosurgery
   - Patients in remote situations
   - Conscious sedation
   - Ambulatory/Day case surgery
   - Hypotensive Anaesthesia
   - Airway management problems
   - Trauma Surgery and resuscitation
   - Obstetric procedures
   - Paediatric Surgery
   - Endocrine Surgery

3.0 Other
   - General management of patients with cardiovascular, respiratory, endocrine, metabolic, hepatic, neurological, neuromuscular, gastro-intestinal, musculo-skeletal, and renal disorders
   - Critical & Intensive Care Medicine
   - Ethics and Medico-Legal Issues
   - Conscious sedation
   - Acute & chronic pain management

Recommended Reading List for Part II


5. IN ADDITION:
   Candidates are referred to more specialised texts for the various subspecialist areas of anaesthesiology.

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