



# College of Intensive Care Medicine

## Primary Examination Mock Exam

(APPENDIX 2)

*This Mock Examination is prepared to provide candidates, tutors and their Supervisors of training with information about the way the Examiners will assess the performance of candidates in the Examination. Example questions provided are to be used as a guide only as to what may be expected. Candidates should discuss the Exam with their tutors so that they may prepare appropriately for the future examinations. It should be read in conjunction with the Notes to Candidates.*

### **WRITTEN EXAM**

#### **GLOSSARY OF TERMS**

- **Calculate** Work out or estimate using mathematical principles
- **Classify** Divide into categories; organize, arrange
- **Compare** Examine similarities and differences
- **Define** Give the precise meaning
- **Describe** Give a detailed account of
- **Explain** Make plain, interpret, and account for
- **Interpret** Explain the meaning or significance
- **Outline** Provide a summary of the important points.
- **Relate** Show a connection between
- **Understand** Appreciate the details of; comprehend

#### **Paper 1**

##### **Short Answer Questions (SAQ's)**

1. Compare and contrast the anatomy of the upper airway in a neonate, a paediatric patient and an adult.
2. Explain the role of the baroreceptors in control of blood pressure.
3. Describe the hepatic blood flow. Explain how you would measure hepatic blood flow.

4. Describe the pharmacology of adenosine and its potential uses in critical care.
5. Outline the principles of antimicrobial resistance and the factors that influence this.
6. Define the therapeutic index and its significance. Give examples from drugs used in Intensive Care.
7. Describe how surface tension affects lung mechanics.
8. Compare and contrast morphine and fentanyl used as continuous infusions for analgesia for intensive care.
9. Outline the pharmacology of syntocinon
10. Explain the concept of renal clearance and how this is measured.
11. Define cerebral perfusion pressure and the factors that influence this.
12. Explain the difference between zero and first order kinetics. Give examples relevant to intensive care.

### Short Facts Questions (SFQ's)

The following questions require you to fill in the blanks in the sentence. Please write your answers in the section in answer sheet one.

1. The following arterial blood gas is consistent with a .....  
 pH 7.48  
 PaO<sub>2</sub> 105 mmHg  
 PCO<sub>2</sub> 29 mmHg  
 HCO<sub>3</sub> 21 mmol/L  
 BE -1  
 SaO<sub>2</sub> 99%  
 FiO<sub>2</sub> .21
2. The three main determinants of respiratory rate in a normal adult are  
 .....  
 .....  
 .....

3. The following cardiovascular parameters in an adult are consistent with ..... shock  
HR 140/min  
BP 80/55 mmHg  
CVP 1mmHg  
Cardiac output 3.0 L/min
  
4. A patient who is stable on warfarin (INR 3.0) has recently been started on amiodarone.  
The resultant INR would be ..... compared to above and the mechanism of this interaction is .....
  
5. For effective sublingual administration , drugs should be ..... and .....
  
6. Midazolam has pH dependent imidazole ring opening. When the pH value is less than ..... the ring remains..... This maintains the water solubility of the drug.
  
7. Suxamethonium is associated with life threatening..... in patients with.....  
  
This adverse effect is NOT prevented by pretreatment with a non depolarising neuro muscular blocking drug.
  
8. The following characteristics describe the drug .....  
Intravenously administered beta blocker, cardioselective, no partial agonist activity, dose modification not required in renal or hepatic disease.
  
9. Stimulation of the high pressure baroreceptors leads to vasodilation and bradycardia. Stimulation of the low pressure receptors in the atria leads to ..... and.....
  
10. An ECG showing ST segment elevation in leads II, III and aVF reflects ischaemia involving the ....coronary artery and the ..... wall of the left ventricle.

In the following questions the information in the lists needs to be matched. Not all of the options in list B will be used.

With regard to a left ventricular pressure volume loop in a normal adult match the measurements in list A with the parameters in list B.

**List A**

- 11. Left ventricular end diastolic volume
- 12. End diastolic volume minus end systolic volume
- 13. Pressure at aortic valve opening
- 14. Pressure at peak ejection
- 15. Area of the pressure volume loop

**List B**

- A. Aortic diastolic pressure
- B. Stroke volume
- C. Aortic systolic pressure
- D. Stroke work
- E. Afterload
- F. Preload
- G. Left ventricular stroke work index

In the following questions please rank the answers as instructed;

- 16. Rank the following from the highest to the lowest osmolality.  
Proximal convoluted tubule, distal convoluted tubule, tip of loop Henle, distal collecting duct
- 17. Rank the following from the highest to the lowest PCO<sub>2</sub>  
Mixed venous PCO<sub>2</sub>, end tidal PCO<sub>2</sub>, arterial PCO<sub>2</sub>, expired PCO<sub>2</sub>.
- 18. Rank the following circulations from the highest to the lowest blood flow in terms of ml/100gm/min  
cardiac, brain, renal, liver
- 19. Rank the following fluids from the highest to the lowest sodium concentration in mmol/L  
8.4% sodium bicarbonate, 0.9% sodium chloride, Lactated Ringers, enteral feed solutions
- 20. At equipotent doses rank the following drugs in order from the drug producing the greatest increase in blood pressure to the least  
  
Isoprenaline, noradrenaline, adrenaline, salbutamol.

# ORAL EXAM

## **Introductory Oral Questions**

### **Examples include:**

- Describe the composition of cerebrospinal fluid
- Describe drug delivery systems
- Outline the determinants of Osmotic pressure
- Outline the adverse effects of Suxamethonium
- Describe different systems of temperature measurement
- Describe the differences in the penicillin class of drugs
- Outline the different types of Shock
- Describe the adverse effects of non-steroidal anti inflammatory drugs
- Describe the control of breathing
- Describe the coronary circulation
- Outline the pharmacology of sodium bicarbonate
- Describe the electrolyte composition of gastric secretions

### **Examples of progression of oral questions**

Some oral questions may be solely in physiology or pharmacology and some may cross the disciplines

#### **Example 1**

Interpret an arterial blood gas showing a chronic respiratory acidosis.

Draw a spirograph that would be consistent with these blood gases (chronic obstructive disease).

Describe the mechanism of action of bronchodilating drugs.

#### **Example 2**

Describe the anatomy of the subclavian vein

Draw a venous blood gas you would expect if a sample were taken from this vein

How would you measure flow in this vein?

### **You may also be expected to:**

- Interpret data from a pulmonary artery catheter consistent with cardiogenic shock
- Calculate the loading and infusions doses for a drug
- Analyse a drug chart for interactions and describe them
- Interpret ICU equipment and monitoring (eg. capnograph traces)