Example SBA Questions for Primary FRCA

1. A patient in hospital develops a tachycardia with a regular rate of 145 bpm and a blood pressure of 95/42 mm Hg. He denies chest pain, although he is acutely aware of his rapid heart rate. An ECG shows the duration of the QRS complex to be 0.10 s.

The single most appropriate immediate treatment is:

A. Adenosine 6mg

B. Amiodarone 300mg

C. DC Cardioversion

D. Digoxin 0.5mg

E. Esmolol 100 mg

Answer: A

2. The following arterial blood gas results were obtained from a 70 kg, 46 year-old patient breathing room air:
pH 7.31; p_aCO_2 3.5 kPa; p_aO_2 10.5 kPa; HCO_3^- 12 mmol L^{-1}; Hb 68 g L^{-1}

Which of the following is the single most likely physiological abnormality associated with these results:

A. A cardiac index of 2.8 L min^{-1} m^{-2}

B. A hydrogen ion concentration of 50 nmol L^{-1}

C. A minute volume of 3 L min^{-1}

D. A serum chloride of 108 mmol L^{-1}

E. A urine output of 30 ml h^{-1} for the last 6 hours

Answer: B

3. A 48-year old unemployed man who is being treated for depression was brought into the Emergency Department having taken an overdose. A 12-lead ECG is recorded that is abnormal.

Which of the following abnormalities is the single best predictor of life-threatening arrhythmias occurring in this patient:

A. Axis of +100 degrees

B. QRS duration of 120 ms

C. QT interval of 360 ms

D. T-wave inversion in leads II and III

E. Tachycardia of 120 bpm

Answer: C

4. The context sensitive half-time of a new intravenous analgesic agent is found to be constant. It has a half-life of 5 minutes and a volume of distribution of 15 litres.

Which of the following is the single most likely explanation for this pharmacokinetic behaviour:

A. Hepatic extraction ratio of 0.3

B. High lipid solubility

C. High plasma protein binding

D. Hofmann elimination

E. The drug is an ester

Answer: E

5. A fit 30-year old experiences a vaso-vagal attack at the sight of a needle used for taking a blood test.

Which of the following receptors is primarily responsible for his collapse:

A. Muscarinic receptors in the nucleus accumbens

B. Nicotinic receptors at the skeletal neuromuscular junction

C. Nicotinic receptors in the tractus solitarius

D. Post-ganglionic muscarinic receptors in the heart

E. Pre-ganglionic nicotinic receptors within the parasympathetic ganglion

Answer: D

6. A researcher is studying factors affecting skeletal muscle metabolism at rest under normal conditions of oxygen delivery in a laboratory setting.

Under these circumstances, which one of the following contributes most to energy production:

A. Anaerobic glycolysis

B. Creatine phosphorylation

C. Glycogenolysis

D. Oxidation of NADH

E. Oxidative phosphorylation

Answer: E

7. A patient is undergoing an emergency laparotomy for small bowel obstruction. Intra-operative temperature measured with an infrared tympanic thermometer is 35 C.

The single most important mechanism of this heat loss is:

A. Conduction

B. Convection

C. Evaporation

D. Radiation

E. Respiration

Answer: D

8. The results of a new rapid screening test designed to identify the H1N1 virus compared with the gold standard test, PCR (polymerase chain reaction), are given in the table below.

	PCR +ve	**PCR -ve**
New test positive	**92.5**	**2.5**
New test negative	**7.5**	**97.5**

Which one of the following statements best describes the performance of the new test:

A. The false positive rate is less than the false negative rate

B. The negative predictive value is 92.8%

C. The positive predictive value is 97.4%

D. The negative predictive value is less than the specificity

E. The sensitivity is 92.5% and the specificity 97.5%

Answer: E

9. A 78 year-old man is oliguric with a urine output of less than 0.5 ml kg^{-1} h^{-1} 48 hours after a laparotomy for colonic carcinoma.
Laboratory testing of his urine composition shows a specific gravity of 1.020, sodium of 1.8 mmol L^{-1}, and an osmolarity of 610 mOsm L^{-1}.

Which one of the following is the single most likely diagnosis:

A. Acute tubular necrosis

B. Analgesic nephropathy

C. Hypovolaemia

D. Inappropriate ADH secretion

E. Sepsis

Answer: C

10. You are about to pre-oxygenate a male patient, who has a BMI of 35 kg m^{-2}, prior to rapid sequence induction of anaesthesia. You are using a tightly fitting facemask and oxygen at 6 L min^{-1} and plan to continue this for three minutes.

Which is the single most efficient method of achieving this:

A. A Bain breathing system, with the patient sitting up at 30 degrees

B. A Bain breathing system, with the patient supine

C. A Mapleson A breathing system, with the patient sitting up at 30 degrees

D. A Mapleson A breathing system, with the patient supine

E. A Mapleson D breathing system, with the patient sitting up at 30 degrees

Answer: C

11. A 20 year-old motorcyclist has fractured his femur one hour previously on the way home from the pub. He is in a cervical collar and his head is immobilised. He states he has no pain in his neck on palpation. Cervical spine radiography is unavailable for two hours and the surgeons wish to operate as soon as possible as his dorsalis pedis pulse is absent. The trauma theatre is free and a trained operating department assistant is available.

Which is the single most appropriate course of action:

A. Anaesthetise the patient as soon as possible using a rapid sequence induction retaining full cervical spine immobilisation

B. Delay the procedure for at least 5 hours so that the patient is appropriately fasted

C. Delay the procedure until the cervical spine is cleared by X-ray

D. Give ranitidine 50 mg IV and anaesthetise the patient in one hour with full cervical spine immobilisation and a rapid sequence induction

E. Transfer to theatre immediately, remove the collar and with in-line spinal stabilization perform a rapid sequence induction

Answer: E

12. A fit 25-year old is asked to alter his respiratory rate and/or tidal volume. He starts with a respiratory rate of 15 per minute and a tidal volume of 450 ml. Physiological dead space and minute ventilation are measured for each manoeuvre.

Which one of the following results in the greatest increase in the ratio of physiological dead space to minute ventilation:

A. Doubling respiratory rate, no change in tidal volume

B. Doubling tidal volume, doubling respiratory rate

C. Doubling tidal volume, no change in respiratory rate

D. Halving respiratory rate, doubling tidal volume

E. Halving tidal volume, doubling respiratory rate

Answer: E