



**THE HONG KONG COLLEGE OF ANAESTHESIOLOGISTS**  
**FINAL FELLOWSHIP EXAMINATION (INTENSIVE CARE)**  
**SHORT ANSWER PAPER**

**15 Questions**

**Monday 15 July 2024 (9:30 am - 12:00 nn)**

**NOTICE**

- (A) Write your answers to the 15 questions in separate books.
- (B) It is not necessary to rewrite the question in your answer book.
- (C) You should answer each question in ten minutes or less.
- (D) The questions are worth equal marks.
- (E) Record your number on the cover of each book and hand in all books.
- (F) Use ink or ball-point pen

**Question 1**

Regarding new onset atrial fibrillation in critically ill patient.

- a) List 4 common causes in Intensive Care Unit (ICU) (2 marks)
- b) Outline your approach to assessment. (4 marks)
- c) Outline your management. (4 marks)

**Question 2**

During the airway management in a trauma patient with tracheal fracture.

- a) What difficulties and complications would you anticipate during securing the airway? (2.5 marks)
- b) Outline 3 techniques of securing the airway and the pros and cons of each (7.5 marks).

**Question 3**

A 43-year-old 200kg man was admitted to ICU for septic shock and renal failure due to faecal peritonitis. His course was complicated by gastrointestinal bleeding needing endoscopic intervention. He was put on renal replacement therapy (RRT) for two days, but his urea level kept on increasing. The RRT was interrupted due to various reasons.

- a) Suggest a renal replacement modality that you would apply on this patient with explanation (2 marks).
- b) Outline the modification in renal replacement plan and management plan that you would apply to maximize urea clearance for this gentleman. (8 marks)

#### Question 4

Please tabulate the following on triggers of mechanical ventilation.

- a) Triggers (2.5marks)
- b) Mechanism of trigger (2.5marks)
- c) Advantages (2.5marks)
- d) Disadvantages (2.5marks)

#### Question 5

A 56-year-old man underwent an elective right total knee replacement 3 weeks ago. He was discharged home on post-op day 3 and mobilizing well. He was admitted to the medical ward yesterday with fever and right knee pain. Blood cultures grew *Staphylococcus aureus* resistant to methicillin. After 4 days of admission, he developed septic shock and required admission to ICU.

- a) List 4 antimicrobials that are effective against MRSA (4 marks)
- b) Outline the key management priorities apart from antimicrobial therapy (6 marks)

#### Question 6

- a) List 4 causes of sudden cardiac arrest in 3rd trimester of pregnancy (4 marks)
- b) Describe your management plan for a 35-week pregnant lady who developed a witnessed cardiac arrest. Be specific on how the resuscitation in this setting differs from that of cardiac arrest in non-pregnant patients. (6 marks)

#### Question 7

You are the Consultant in charge of ICU admissions. A 70-year-old man with Gold Stage 3 COPD was admitted to the medical ward with CO<sub>2</sub> narcosis. Despite non-invasive ventilation his condition has not improved, and he remains unconscious. The medical team consulted ICU for mechanical ventilation and admission to ICU.

According to the clinical notes this patient has declined mechanical ventilation during previous hospital admissions even if it was lifesaving due to discomfort and “progressive decline in quality of life.” He was hospitalized six times last year. He can only manage 10 minutes level ground due to severe dyspnoea. Your impression was mechanical ventilation was not appropriate and decide to triage this patient from ICU care.

His daughter has requested to see you and demanded the use of “mechanical ventilation.”

- a) What are the key ethical issues in this scenario? (4 marks)
- b) What are the key discussion points with his daughter? (6 marks)

#### Question 8

- a) Explain the mechanism of intra-aortic balloon pump (IABP). (4 marks)
- b) Explain the pathophysiology of left ventricular overload in patient with VA-ECMO (4 marks)
- c) Compare IABP and Impella as left ventricular unloading assist device in terms of outcome. (2 marks)

### Question 9

A 34-year-old female, with good past health, got infected by her child with a viral respiratory infection three weeks ago. She had low grade fever, headache, fatigue, confusion, diplopia, weakness and numbness of her right leg. She obeyed commands but appeared to be drowsy. Central nervous system exam reveals poor visual acuity, nystagmus and ataxia. Medical research council (MRC) scale of her right leg is 3/5. CT Brain was grossly normal.

CSF shows:

Parameter	Result
WCC	100 per cu. mm
Lymphocyte	70 %
Neutrophil	20 %
Red cell	100 $\times 10^3$ per cu. mm
Protein	0.7 g/L (0.15-0.45 g/L)
Glucose	4 mmol/L
Gram stain and culture	Negative
HSV PCR	Negative

- List top four differential diagnosis (4 marks)
- What investigation would you do besides MRI Brain (3 marks)
- MRI Brain shows bilateral and asymmetric, multiple poorly defined lesions in the deep and subcortical white matter, characteristic of demyelination. The lesions are hyperintense on T2-weighted and fluid attenuated inversion recovery (FLAIR) sequences. What is your diagnosis? (1 mark)
- What specific treatment you will provide him? (2 marks)

### Question 10

- What are the effects and complications of Propranolol overdose? (3 marks)
- Outline your management for a patient with Propranolol overdose. (7 marks)

### Question 11

- What is dialysis disequilibrium syndrome? (2 marks)
- What are the risk factors? (2 marks)
- List 4 clinical features. (2 marks)
- What preventive measures can you take to reduce its occurrence? (2 marks)
- How would you treat a patient with dialysis disequilibrium syndrome? (2 marks)

### Question 12

Tabulate your answer for this question.

- List the different monitoring tests for unfractionated heparin infusion. (2 marks)
- State the pros and cons of different tests. (8 marks)

### Question 13

- a) What are the causes of hypernatremia in patients in ICU? (3 marks)
- b) How would you evaluate and manage an ICU patient with hypernatremia? (7 marks)

### Question 14

Discuss the following on the topic of heat stroke.

- a) Types of heat stroke (1 mark)
- b) Clinical features (2 marks)
- c) Differential diagnoses (2 marks)
- d) Complications (2 marks)
- e) Management (3 marks)

### Question 15

A trainee is designing a randomized control trial to investigate the effect of a new anti-inflammatory drug (Drug X) for treating patients with COVID-19 pneumonia in Intensive Care Unit (ICU). Patients with COVID-19 pneumonia in ICU are randomized into study group and control group. Drug X is administered to patients in study group while patients in control group receive placebo. The proportions of ICU mortality and length of ICU stay in the 2 groups of patients are compared.

- a) What is the null hypothesis of the study? (1 mark) What is the alternative hypothesis? (1 mark)
- b) Name 2 statistical tests to compare the proportions of ICU mortality in the 2 groups of patients. (2 marks)
- c) Name 2 statistical tests to compare the length of ICU stay in the 2 groups of patients (2 marks).
- d) What does the p value of the statistical test mean? (1 mark)
- e) The level of significance is set to be 0.05. If the p value is less than the 0.05, what does it mean regarding the null hypothesis? (1 mark)
- f) Define Type I and Type II errors. (2 marks)

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