

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

Monday, 3 August 2026
(1:30 pm - 4:00 pm)

15 Questions (Question 16 – 30)

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 candidate number on the cover of each book and hand in all books.
- (F) Use ink or ball-point pen

Question 16

- a. State the most common causative organism of toxic megacolon in ICU patients and describe its pathophysiology. (1mark)
- b. What are the risk factors for this organism in ICU patients? (2 marks)
- c. Describe the typical presentation of toxic megacolon and outline your diagnostic approach. (2 marks)
- d. Outline your management of toxic megacolon in the critically ill patient. (3.5 marks)
- e. Discuss the indication of surgery in a deteriorating patient with toxic megacolon. (1.5 marks)

Question 17

Regarding mechanical circulatory support (MCS)

- a. Describe the features of Impella device and how it functions to support the heart. (1 mark)
- b. Outline its common variants, highlighting the key features. (1.5 marks)
- c. Outline the contraindications/ exclusion criteria for Impella. (2.5marks)
- d. State the major complications associated with the use of Impella. (3 marks)
- e. Describe the parameters that should be monitored in a patient supported by an Impella device. (2 marks)

Question 18

Discuss the key principles in the intra-hospital transport of a critically ill patient. (10 marks)

Question 19

A 60-year-old man was admitted for isolated blunt chest trauma whilst working at a construction site. He was intubated for severe respiratory failure due to multiple rib fractures, flail chest and pneumothorax. Chest x-ray on day 3 still showed persistent chest infiltrates and he had a PF ratio of 200 mmHg while on FiO₂ of 0.6. He was a chronic smoker and has mild chronic obstructive pulmonary disease.

- a. What clinical features may help you decide whether this patient has developed a ventilator-associated pneumonia (VAP)? (3 marks)
- b. Clinical features only have moderate sensitivity and specificity to diagnose VAP. Please illustrate using this scenario. (7 marks)

Question 20

PiCCO system is inserted for hemodynamic monitoring for a patient with right ventricular failure secondary to chronic thromboembolic pulmonary hypertension (CTEPH).

- a. Explain the major limitation of using PiCCO monitoring specifically in patients with predominant right ventricular failure. (3 marks)
- b. In this clinical context, briefly state why pulmonary artery catheter (PAC) monitoring might be preferred over PiCCO. (3 marks)
- c. Outline the key principles of hemodynamic management in a patient with predominant right heart failure and briefly explain the rationale for each. (4 marks)

Question 21

A 60-year-old man with severe pneumonia and ARDS is intubated, ventilated with a lung-protective strategy and has just been turned from supine to prone by the ICU team. Within minutes, he becomes hypotensive and more hypoxic.

- a. List the possible causes of this acute clinical deterioration soon after prone positioning. (4.5 marks)
- b. Outline how you would assess and manage these problems. (5.5 marks)

Question 22

- a. What are the potential complications of extravasation of undiluted Calcium Chloride during intravenous injection via peripheral intravenous access? (1 mark)
- b. What are the mechanisms of Calcium extravasation injury? (3 marks)
- c. What are the immediate managements for a patient with Calcium Chloride extravasation? (6 marks)

Question 23

A 55-year-old male is admitted to the ICU following an out-of-hospital cardiac arrest (OHCA) due to ventricular fibrillation (VF). Return of spontaneous circulation (ROSC) was achieved after 15 minutes. He remains comatose. **Critically evaluate** the key physiological targets and management priorities for his post-resuscitation care in the first 24 hours. (10 marks)

Question 24

A 34-year-old male diver was rescued from 10°C seawater after 45 minutes of submersion. On admission to the ICU, his GCS is 3/15, core temperature is 24.8°C, heart rate is 35 bpm, and blood pressure is 95/55 mmHg. He is intubated, ventilated, and active rewarming is commenced.

- a. List five types of rewarming therapies applicable to this patient. For each, state one advantage and one disadvantage. You may tabulate your answer. (5 marks)
- b. After 90 minutes of primarily active external rewarming, his body temperature rises to 26.2°C, then suddenly drops to 25.1°C, accompanied by worsening hypotension and bradycardia. What is the most likely diagnosis for this deterioration? Explain its pathophysiology. (2 marks)
- c. Identify three specific risk factors in this case that predisposed him to this complication. (1.5 marks)
- d. Outline three immediate management steps for this complication. (1.5 marks)

Question 25

Compare and contrast Guillain-Barre Syndrome and ICU-acquired weakness under the following headings. You may tabulate your answer.

- a. Clinical features (6 marks)
- b. Diagnostic investigation findings (2 marks)
- c. Specific treatments (2 marks)

Question 26

A 50-year-old man in the ICU develops fever, chills and rigors during transfusion of a unit of packed red cells. There is no rash or bronchospasm.

You may tabulate your answers to the following questions.

- a. List the important acute transfusion reactions that may present with these features. (2 marks)
- b. For each, outline the key distinguishing clinical features and the key investigations. (8 marks)

Question 27

A 62-year-old male with known Child-Pugh class C HCV cirrhosis and a prior history of esophageal varices presents with sudden-onset massive hematemesis and melena for the past 3 hours following a heavy alcohol binge. On arrival to ICU, he is tachycardic (HR 125 bpm), blood pressure on 100/60mmHg with altered sensorium (Glasgow Coma Scale 12) and ongoing fresh hematemesis. He has no known allergies or recent anticoagulant use.

- a. What definitive intervention will you arrange for his variceal bleeding? (1 mark)
- b. What medications would you use in treating variceal bleeding. State the reasoning. (not medication related to resuscitation) (2.5 marks)
- c. What measures can be used if the bleeding is refractory despite the above method? (1.5 marks)
- d. What measures will you take to prevent hepatorenal syndrome after control of variceal bleeding? (5 marks)

Question 28

A 30-year-old woman was admitted for community-acquired pneumonia requiring mechanical ventilation and vasopressor support. On day 5 of ICU admission, thyroid function tests were ordered for transient atrial fibrillation (results as shown below). The patient had no known history of thyroid disease.

- TSH: 0.8 mIU/L (reference range: 0.5-5.0 mIU/L)
 - Free T4: 10 pmol/L (reference range: 10-20 pmol/L)
 - Free T3: 2.1 pmol/L (reference range: 3.5-6.5 pmol/L)
 - Reverse T3: elevated
- a. What is the most likely diagnosis? (0.5 mark)
 - b. Briefly describe two possible mechanisms for the thyroid hormone changes in the above condition. (1 mark)
 - c. Is thyroid hormone replacement therapy indicated in this patient? (0.5 mark) Justify your answer. (1.5 marks)

This patient made a full recovery and was discharged home. Three years later, she presented with fever, shortness of breath and palpitations. Her heart rate was 170/min with an irregular rhythm. In the preceding months, she also had unintentional weight loss, tremor, heat intolerance, diarrhoea and oligomenorrhea.

- d. What is the most likely diagnosis? (0.5 mark)
- e. Outline the immediate pharmacological treatments for the above condition. (6 marks)

Question 29

You are the ICU Consultant in charge of infection control in your unit. A hand hygiene audit was performed last month which showed a 60% compliance rate amongst medical staff. In particular, you observed that a new junior doctor frequently does not use alcohol handrub in clinical areas. Other members of the ICU team have also noticed this behavior. You decide to talk to the junior doctor about this.

- a. What are the key issues in this scenario? (2 marks)
- b. What are the key discussion points with this new junior doctor? (8 marks)

Question 30

A recent study investigated the performance of two different tools to predict mortality in patients presenting with severe herbicide poisoning.

The study enrolled 100 patients. For each patient, the admission serum lactate level and the APACHE II score were recorded. The primary outcome was in-hospital mortality. The area under the receiver operating characteristic (ROC) curve (**Figure 1**) was used to compare the predictive accuracy of serum lactate versus the APACHE II score for mortality.

Figure 1.

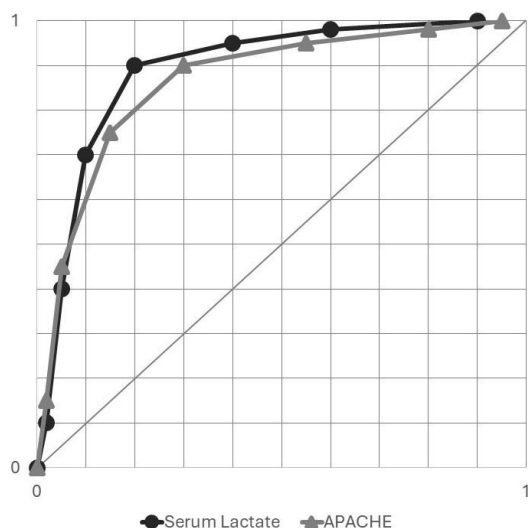


Table 1.

	Died (n=40)	Survived (n=60)
Lactate > 4.0 mmol/L	36	12
Lactate ≤ 4.0 mmol/L	4	48

Table 2.

Serum Lactate (mmol/L)	Sensitivity	Specificity	APACHE II Score	Sensitivity	Specificity
5.0	0.95	0.60	25	0.95	0.45

- Using the data in **Table 1**, calculate the following test characteristics for a serum lactate cut-off of >4.0 mmol/L to predict mortality.
 - Sensitivity (1 mark)
 - Specificity (1 mark)
 - Positive Likelihood Ratio (1 mark)
- What are the x-axis and y-axis in **Figure 1** referring to? (1 marks)
- Which test is a better predictor of mortality in this study? Justify your answer by referring to **Figure 1**. (2 marks)
- What statistical test is used to compare the area under curve (AUC) of serum lactate with the AUC of the APACHE II score? (1 mark)
- A patient presents 4 hours after ingesting herbicide. His admission serum lactate is 5 mmol/L and APACHE II score is 25. Using the data from **Table 2**:
 - Explain what these values mean for this patient in terms of survival probability. (2 marks)
 - Explain the clinical meaning regarding the different specificity of lactate and APACHE II score at these values. (1 mark)

- End -