



COLLEGE OF INTENSIVE CARE MEDICINE OF AUSTRALIA AND NEW ZEALAND

SECOND PART PAEDIATRIC WRITTEN EXAMINATION WEDNESDAY 13th AUGUST 2025 MORNING PAPER

- (A) Write your answers in the blue books provided. **Each** question should be answered in a separate booklet. Please **DO NOT** write two short answer questions in the same booklet.
- (B) Start each answer on a **new booklet** and indicate the **question number**. It is not necessary to rewrite the question in your answer book.
- (C) You should aim to answer each question in **ten** minutes.
- (D) **All** questions are worth ten marks each in total.
- (E) Record your **candidate number** and each **question number** on the cover of each book, page, and hand in all books.

GLOSSARY OF TERMS

Critically evaluate:	Provide and explain the evidence available relating to a topic.
Outline:	Provide a summary of the important points.
List:	Provide a list.
Compare and contrast:	Provide a description of similarities and differences.
Assessment:	Generic term that implies determining an underlying diagnosis, encompassing history, clinical examination, and relevant investigations.
Management:	Generic term that implies determining an overall management plan, encompassing resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment.
Discuss:	Explain the underlying key principles. Where appropriate, this should include controversies and/or advantages and disadvantages.
Explain:	Make plain or known in detail.

NOTE

Where laboratory values are provided, abnormal values are marked with an asterisk (*).

Answer Each Question in a Separate Booklet

Question 1

A 12-year-old child with a known nut allergy presents to the emergency department (ED) with presumed anaphylaxis. The child received two doses of intramuscular adrenaline (EpiPen ®) at home and one intramuscular 10 microgram/kg adrenaline in ED. The child has a widespread urticarial rash, stridor and increased work of breathing.

The patient's vital signs are:

- Heart Rate 150 beats per min,
- Blood Pressure 76/40 mmHg,
- Respiratory Rate 30/min,
- Saturations 88% on 10 L/min via non-rebreather mask.

- a) Describe the pathophysiology of anaphylaxis (2 marks)
- b) Outline the management of this patient (6 marks)
- c) Describe the role of measuring tryptase in your clinical practice (2 marks)

Question 2

Outline the key principles for reducing antimicrobial resistance in the ICU. (10 marks)

Question 3

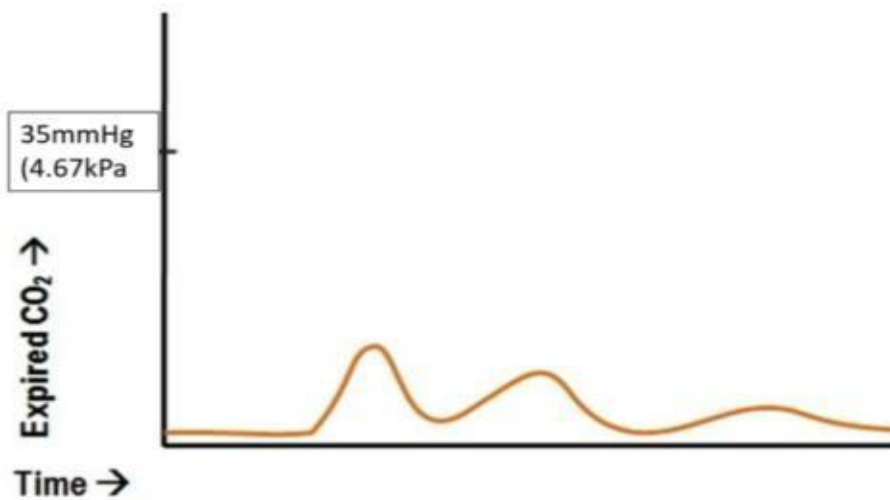
In a pre-operative neonate with hypoplastic left heart syndrome, currently spontaneously breathing in low flow oxygen, outline the potential causes and your approach to management if:

- a) SpO₂ 87% and Lactate 1.7mmol/L (2 marks)
- b) SpO₂ 91% and Lactate 4mmol/L (4 marks)
- c) SpO₂ 55% and Lactate 4mmol/L (4 marks)

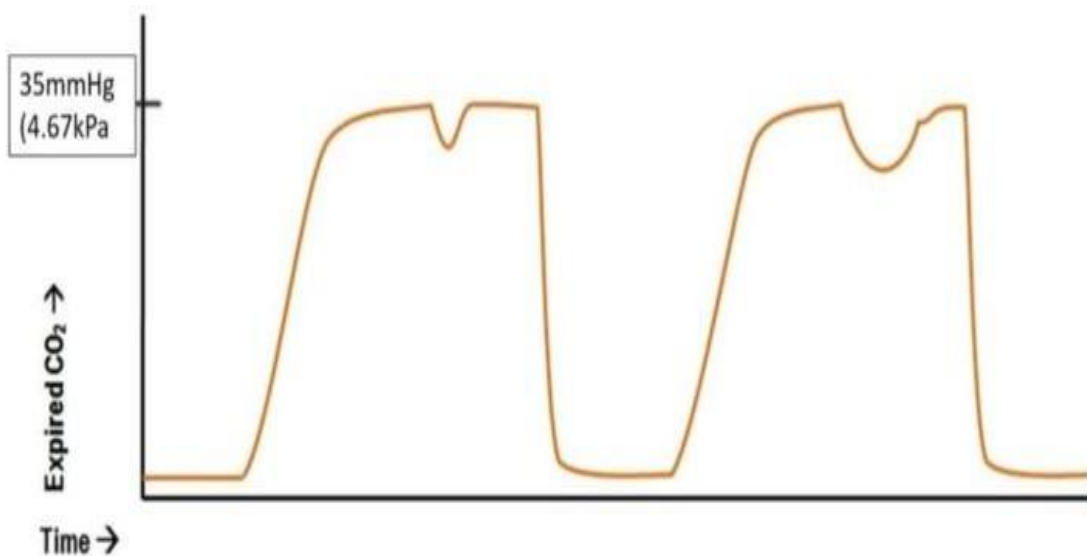
Answer Each Question in a Separate Booklet

Question 4

- a) Outline the principles of capnometry, including sensor types. (2 marks)
- b) In a patient with severe ARDS, discuss potential causes of an increasing gradient between PaCO₂ and EtCO₂ (end tidal CO₂) measurements and your approach to managing this issue. (6 marks)
- c) In the following capnographs, state the aetiology of the abnormality and one clinical response you could take. (2 marks)
- i. In a ventilated patient Immediately Post Intubation:



- ii. In a patient on controlled ventilation:



Answer Each Question in a Separate Booklet

Question 5

A 2-year-old is admitted with presumed septic shock, requiring intubation and ventilation for respiratory failure and inotropic support for hypotension.

Management has included:

- 50ml/kg fluid bolus
- Adrenaline, noradrenaline and vasopressin infusions
- Broad-spectrum antibiotics, which include Ceftriaxone, Vancomycin, and Clindamycin

Urine output is currently 1ml/kg/hr.

Blood results taken after the above treatment are below:

Parameter	Patient value	Reference
pH	7.26*	7.35 – 7.45
pCO ₂	49 mmHg (7.5 kPa)*	35 – 45 (4.7 – 6.0)
pO ₂	92 mmHg (12.3 kPa)	75 – 105 (10.7 – 14.0)
BE	- 4.5 mmol/L*	- 2.0 – +2.0
HCO ₃	10.0 mmol/L*	25.0 – 27.0
Na	149 mmol/L*	134 – 145
K	4.8 mmol/L	3.3 – 4.9
Cl	108 mmol/L*	97 – 106
Glucose	6.8 mmol/L*	3.5 – 5.4
Lactate	7.0 mmol/L*	< 2.0
Creatinine	90 umol/L*	11-36
Urea	12 mmol/L*	1.0-6.0

- a) List risk factors for Acute Kidney Injury (AKI) in this patient. (3 marks)
- b) Outline your management of AKI in this patient. (5 marks)
- c) What are the outcomes of sepsis-associated AKI? (2 marks)

Answer Each Question in a Separate Booklet

Question 6

A 5-year-old boy (weight 20kg) is currently intubated, ventilated and sedated in PICU. You have decided to initiate Total Parenteral Nutrition (TPN) to meet his full nutritional requirements.

Write a TPN prescription for the next 24 hours assuming a fluid allowance of 100% Maintenance.

(10 marks)

Question 7

Discuss the challenges associated with invasive ventilation in a previously well 3-month-old infant with bronchiolitis, and your approach to managing these challenges.

(10 marks)

Question 8

A 4-year-old boy presents with progressive ataxia, vomiting, and 'drunken' behaviour after exposure to open containers of methylated spirits (methanol) and radiator coolant (ethylene glycol) in his grandfather's shed.

a) Describe how you would assess the severity of intoxication and determine whether one or both agents are involved. Include key clinical signs, relevant investigations, and thresholds for initiating treatment. (6 marks)

b) Severe ethylene glycol intoxication is confirmed. Outline your management plan. (4 marks)

Answer Each Question in a Separate Booklet

Question 9

A paediatric patient has been admitted to the intensive care unit after a submersion injury. They received cardiopulmonary resuscitation (CPR) prior to admission.

Outline the predictors of poor neurological outcome at the following time points during the admission.

- a) At the scene (3 marks)
- b) On presentation to hospital (3 marks)
- c) 72 hours after PICU admission (4 marks)

Question 10

- a) List two causes of acute paralytic syndrome for each of the following anatomical sites.
 - Spinal cord
 - Anterior horn cell
 - Neuromuscular junction
 - Muscle (4 marks)
- b) With regards to Transverse Myelitis and Guillain Barre syndrome, compare and contrast:
 - Clinical features (2 marks)
 - Management (3 marks)
 - Prognosis (1 mark)

Question 11

Regarding mechanical ventilation in children with severe hypoxic respiratory failure due to Paediatric Acute Respiratory Distress Syndrome (PARDS):

- a) Outline the approach to titration of invasive mechanical ventilation settings in PARDS.
Include the physiologic rationale for these settings. (7 marks)
- b) Outline how the respiratory management should be modified in the setting of severe hypoxia due to unilateral consolidated lung disease. (3 marks)

Answer Each Question in a Separate Booklet

Question 12

- a) Outline the impact of morbid obesity on respiratory function. (2 marks)
- b) In the setting of emergency intubation for hypoxic respiratory failure, describe the specific risks associated with morbid obesity and how you would mitigate these risks. (8 marks)

Question 13

With respect to the surgical repair of Coarctation of Aorta:

- a) Outline the pathophysiological mechanisms contributing to hypertension following coarctation repair. (2 marks)
- b) Discuss the management of hypertension in the immediate postoperative period. (5 marks)
- c) Excluding hypertension, list six potential early complications **specific** to this operation. (3 marks)

Question 14

There is a perception that failed extubations are occurring more frequently in your PICU.

- a) Describe how you would confirm whether this is a real issue. (2 marks)
- b) Outline the steps you would take to design and implement a quality improvement project to reduce the rate of failed extubations. (8 marks)

Answer Each Question in a Separate Booklet

Question 15

Regarding coronary artery involvement in Kawasaki Disease:

- a) Identify 4 risk factors (2 marks)
- b) List 4 echocardiogram findings (4 marks)
- c) Outline specific short term management strategies (2 marks)
- d) List 4 complications (2 marks)

END OF MORNING PAPER