COLLEGE OF INTENSIVE CARE MEDICINE
OF AUSTRALIA AND NEW ZEALAND

SECOND PART PAEDIATRIC WRITTEN EXAMINATION

WEDNESDAY 13th AUGUST 2025

AFTERNOON 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 16

A 14-year-old girl has met criteria for neurological determination of death (brain death) following a severe isolated brain injury. Her family has consented to organ donation but request that the process be delayed until her brother returns from overseas in 3–4 days.

Outline your approach to her physiological and medical care in order to optimise the chances of successful organ and tissue donation.

(10 marks)

(DO NOT discuss the diagnosis of brain death, or the details of pre-donation screening tests.)

Question 17

a) List 4 risk factors for acute upper gastrointestinal bleeding in PICU patients.
(2 marks)

b) List 4 classes of medications used for gastrointestinal stress ulcer prophylaxis in PICU.
(1 mark)

c) Outline potential complications associated with the use of gastrointestinal stress ulcer prophylaxis.
(2 marks)

d) Discuss the evidence for the use of stress ulcer prophylaxis in PICU.
(5 marks)

Question 18

Critically evaluate the role of corticosteroids in Acute Respiratory Distress Syndrome (ARDS). Your answer should include:

a) Pathophysiology and mechanism of action (2 marks)

b) Disadvantages of corticosteroids (2 mark)

c) Evidence for corticosteroids (5 marks)

d) My practice statement (1 marks)

Answer Each Question in a Separate Booklet

Question 19

A previously healthy 14-year-old boy is transferred to your PICU following a mountain biking accident. He has been intubated and ventilated for 48 hours at a regional hospital. His only documented injury is a traumatic cervical spinal cord injury, with a sensory level around C5.

Discuss your approach to his ongoing management. (10 marks)

Question 20

Discuss your approach to red blood cell transfusion in a previously well patient with isolated severe traumatic brain injury (TBI).

Your answer should address the following:

- Physiological rationale (1 mark)
- Risks and disadvantages of transfusion (3 marks)
- Relevant evidence and recommendations (6 marks)

Question 21

You have admitted a previously well 6yr old child who has had an out of hospital cardiac arrest. They received CPR for 35mins before return of spontaneous circulation (ROSC).

a) What features in the history would suggest a primary cardiac cause for the cardiac arrest? (2 marks)

b) Outline the haemodynamic management priorities and specific haemodynamic challenges during the first 6 hours. (6 marks)

c) The ECG taken immediately post ROSC shows a prolonged corrected QT interval (QTc). Explain the significance of this finding. (2 marks)

Answer Each Question in a Separate Booklet

Question 22

In regard to best evidence-based research:

a) Rank the major study designs in order of level of evidence, from highest to lowest, according to standard hierarchies in evidence-based medicine. (2 marks)

b) You are designing a study to evaluate an intervention in the PICU. Identify the study design that would provide the highest level of evidence and outline its strengths and limitations. (4 marks)

c) You are designing a study to evaluate prognosis in the PICU. Identify the study design that would provide the highest level of evidence and outline its strengths and limitations. (4 marks)

Question 23

a) What are the determinants of arterial oxygen saturation in a patient on veno-venous extracorporeal membrane oxygenation (VV ECMO)? (2 marks)

b) With respect to the following issues on ECMO, please outline the mechanism, and the management of:

i) Recirculation in VV ECMO (4 marks)

ii) Differential hypoxemia in veno arterial (VA) ECMO (4 marks)

Question 24

a) In a table, show the changes in thyroid stimulating hormone (TSH) and tri-iodothyronine (T3) levels expected in:
- hypothyroidism;
- subclinical hypothyroidism;
- sick euthyroid syndrome. (2 marks)

b) Outline the pathophysiology in “sick euthyroid syndrome”. (4 marks)

c) Discuss the role of tri-iodothyronine (T3) replacement/supplementation in critically ill children. (4 marks)

Question 25

In table form, compare and contrast early onset neonatal sepsis with late onset neonatal sepsis using the following headings:

- Definition (2 marks)
- Pathogenesis (2 marks)
- Causative organisms (2.5 marks)
- Risk factors (2.5 marks)
- Antimicrobial therapy (1 mark)

Question 26

A 2-year-old boy is admitted following clot retrieval for a right middle cerebral artery (MCA) infarct. He is intubated and ventilated. His endotracheal tube, arterial and central venous lines are well placed.

On arrival, his heart rate is 60 beats per minute and his blood pressure is 180/100mmHg.

a) Outline the immediate priorities of management for this patient. (5 marks)

b) Outline your approach to blood pressure management over the next 12 hours. Justify your decision making including any antihypertensive agents used. (5 marks)

Question 27

A 6-week-old male weighing 3.8 kg is admitted following a complete repair of Tetralogy of Fallot with Subpulmonary Stenosis (TOF-PS). Shortly after arriving to the PICU, he develops Low Cardiac Output syndrome.

In table form, outline the most likely causes of Low Cardiac Output in this patient, how you would make the diagnosis and the specific management for each cause.

(10 marks)

Question 28

Regarding hospital-based Rapid Response Systems (RRS):

a) Provide a definition and discuss the key elements of a RRS. (4 marks)

b) List the advantages and challenges of a Paediatric RRS. (6 marks)

Question 29

With regards to Central Line Associated Blood Stream Infections (CLABSI):

a) Define CLABSI. (2 marks)

b) Outline how the risk of CLABSI could be reduced. (6 marks)

c) What factors do you consider when deciding whether to remove a central venous line with a suspected CLABSI? (2 marks)

Question 30

A 14-year-old boy with Sickle Cell Anaemia is admitted to your PICU from theatre following an elective operation.

Outline the factors that will increase the risk of sickling in the post operate period. Provide examples and outline how to mitigate the risk. (10 marks)

END OF AFTERNOON PAPER