COLLEGE OF INTENSIVE CARE MEDICINE
OF AUSTRALIA AND NEW ZEALAND

SECOND PART WRITTEN EXAMINATION

Wednesday 13th of 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 2 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. You may tabulate your answer.
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 may 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 (*).

Question 16

Regarding new onset atrial fibrillation (AF) in haemodynamically stable patients in the ICU:

a) List **six** potential causes/precipitants of AF (3 marks)

b) Discuss “Rate control” versus “rhythm control” management strategies (4 marks)

c) Outline your approach to anticoagulation (3 marks)

Question 17

Outline your assessment for a suspected smoke inhalational injury in a patient who has presented with severe burns.

(10 marks)

Question 18

A patient has been referred from the Emergency Department with a CT Pulmonary Angiography (CTPA) proven saddle pulmonary embolus (PE) in the context of a recent overseas flight. The following clinical information is available:

- Heart rate 90/min (SR), BP 110/65 (unsupported)
- Respiratory rate 20/min, SpO2 93% via nasal prong oxygen at 4 L/min
- Transthoracic echocardiography (TTE): Moderate right ventricular systolic dysfunction
- Serum troponin mildly elevated

a) Give the risk stratification of the PE. In your answer, provide your rationale (2 marks)

b) Discuss the specific initial treatment options for this patient (8 marks)

Question 19

Compare and contrast community-acquired MRSA (CA-MRSA) and hospital-acquired MRSA (HA-MRSA) under the following headings:

a) Toxin production (2 marks)

b) Clinical features (4 marks)

c) Antimicrobial therapy (2 marks)

d) Risk factors for developing infection (2 marks)

Question 20.1

A 37-year-old patient presents to the Emergency Department. The patient's Glasgow coma score (GCS) is 3 and they are haemodynamically stable.

The biochemistry is as follows:

Parameter	Patient	Reference
Sodium	140 mmol/L	135 – 145
Potassium	3.9 mmol/L	3.5 – 5.0
Chloride	104 mmol/L	95 – 105
Bicarbonate	**8 mmol/L ***	22.0 – 26.0
Glucose	**6.3 mmol/L***	3.5 – 6.0
Urea	3.9 mmol/L	3.0 – 8.0
Creatinine	**112 µmol/L ***	45 – 90
Magnesium	0.84 mmol/L	0.75 – 0.95
Albumin	43 g/L	35 – 50
Protein	78 g/L	60 – 80
Ionised calcium	1.17 mmol/L	1.10 – 1.35
Calcium corrected	2.38 mmol/L	2.12 – 2.62
Osmolality (measured)	**326 mmol/kg ***	275-295

Arterial blood gas is as follows:

Parameter	Patient	Reference
FiO_2	0.21	
pH	**7.3 ***	7.35-7.45
PCO2	**18 mmHg * (2.3 kPa)**	35-45 (4 -6.0)
PO2	**67 mmHg * (8.9 kPa)**	70-100
Bicarbonate	**9 mmol/L ***	22.0 – 26.0
ABE	**-15.9 mmol/L ***	-3-+3
Lactate	4.2 mmol/L *	<3.0

a) Explain the abnormalities. In your answer, show your calculations (2 marks)

b) List **three** possible causes of these results (1.5 marks)

c) List **four** other investigations which would assist in the diagnosis: (2 marks)

Question 20.2

An 81-year-old patient is found to be acutely confused with tachypnoea. Oxygen saturations are 96% on room air and the patient's respiratory rate is 28 breaths/min. They are haemodynamically stable, with a urine output of 15 mls/hour for the last 3 hours.

The patient has been in hospital for 4 weeks being treated for methicillin- sensitive Staphylococcus Aureus (MSSA) mitral valve infective endocarditis with intravenous flucloxacillin.

Biochemistry is as follows:

Parameter	Patient	Reference
Sodium	**147 mmol/L ***	135 – 145
Potassium	3.7 mmol/L	3.5 – 5.0
Chloride	**112 mmol/L ***	95 – 105
Bicarbonate	**11 mmol/L ***	22.0 – 26.0
Glucose	3.9 mmol/L	3.5 – 6.0
Urea	**17.7 mmol/L ***	3.0 – 8.0
Creatinine	**284 µmol/L ***	45 – 90
Magnesium	0.8 mmol/L	0.75 – 0.95
Albumin	**25 g/L ***	35 – 50
Protein	**59 g/L ***	60 – 80
Total bilirubin	12 µmol/L	< 26
Aspartate transferase (AST)	38 U/L	< 35
Alanine transferase (ALT)	15 U/L	< 35
Alkaline phosphatase (ALP)	**200 U/L ***	30 – 110
□-Glutamyl transferase (GGT)	**110 U/L ***	< 40
Calcium corrected	2.29 mmol/L	2.12 – 2.62
Phosphate	**2.4 mmol/L ***	0.8 – 1.5
Creatine Kinase	26 U/L	0-140

Arterial blood gas analysis:

Parameter	Patient	Reference
pH	**7.18 ***	7.35-7.45
PaCO2	**23 mmHg * (3 kPa)**	35-45 (4.6-6.0)
PaO2	**80 mmHg * (10.6 kPa)**	80-100
Bicarbonate	**11 mmol/L ***	22.0 – 26.0
Base Excess	**-20 mmol/L ***	-3.0-+3.0
Lactate	1.2 mmol/L	<3.0
FiO2	0.21	

a) Explain the abnormalities. In your answer, show your calculations (2 marks)

b) Provide the most likely diagnosis (0.5 mark)

c) Give **one** investigation which would assist in confirming the diagnosis (0.5 mark)

d) List **three** risk factors for development of this diagnosis (1.5 marks)

Question 21

Outline your approach to the planned extubation of an adult patient in your ICU who is known to have an anatomically difficult airway.

(10 marks)

Question 22

a) List patient-related factors that increase the likelihood of developing complications from neutropenic sepsis (3 marks)

b) Outline your assessment of a patient presenting with neutropenic sepsis (7 marks)

Question 23

Regarding use of balloon tamponade devices (e.g. the Sengstaken-Blakemore or Minnesota tube) for variceal upper gastrointestinal bleeding:

a) Outline the key steps in *blind emergency* insertion of this device in the ICU emphasising the safety considerations

(7 marks)

b) Outline your strategy for removal of this device in ICU (3 marks)

Question 24

With regards to conducting research within the ICU:

a) Outline the potentials barriers to obtaining informed consent (6 marks)

b) Outline the alternative models of consent which may be used (4 marks)

Question 25

A 58-year-old is admitted to ICU with respiratory failure and haemoptysis on a background of sinusitis.

a) Outline the features on assessment that would support systemic vasculitis as the diagnosis for this presentation

(8 marks)

b) Outline the specific treatment options for systemic vasculitis in this setting (2 marks)

Question 26

A 42-year-old patient is admitted to ICU following elective right adrenalectomy for phaeochromocytoma. The patient is currently sedated and ventilated with an invasive blood pressure of 210/80.

a) List the likely causes for this elevated blood pressure (3 marks)

b) Outline your immediate and ongoing approach to management of the hypertension. In your answer, explain the rationale for any chosen pharmacological treatment(s)

(7 marks)

Question 27

a) List **five** intra-abdominal complications of severe acute alcoholic necrotising pancreatitis

(2.5 marks)

b) For each of the above, outline the specific management

(7.5 marks)

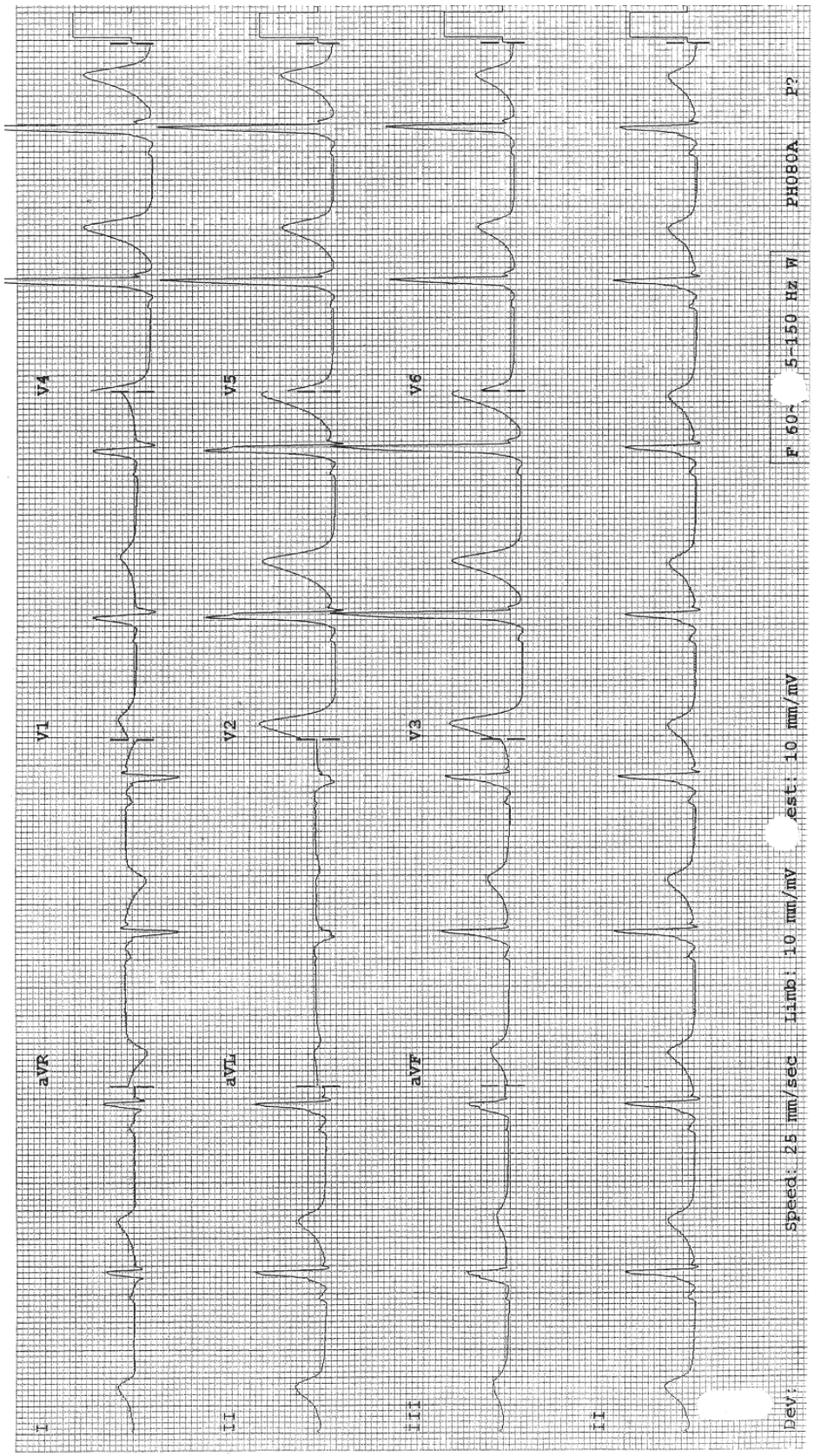
Question 28.1

Examine the ECG provided:

a) List the abnormalities and provide the most likely diagnosis (2 marks)

b) List **two** drugs which are contraindicated in this diagnosis and explain why (2 marks)

c) List **two** complications of this diagnosis (1 mark)



Question 28.2

A patient is admitted to the ICU following an elective Aortic Valve replacement for Aortic Stenosis. Within two hours of admission the patient is hypotensive with a blood pressure of 70/30 (mean 43mm/Hg) and is on an adrenaline infusion at 10mcg/min.

Based on the below echocardiogram report:

a) Explain the cause of this patient's hypotension (1 mark)

b) Outline the principles of management of this patient's hypotension (4 marks)

(Abnormal values are shown in bold)

LEFT VENTRICULAR EVALUATION
Small LV cavity size. Normal systolic function (EF 60%). No regional wall motion abnormalities. E□ = 4 cm/s. **Moderate to severe concentric LV hypertrophy. Flow acceleration noted in LVOT on colour Doppler.**

LEFT ATRIUM
Mildly enlarged. LA area 26 cm^2

RIGHT VENTRICLE
Normal size and systolic function

RIGHT ATRIUM/IVC
Normal.

AORTIC ROOT
Normal

MITRAL VALVE
Structurally normal mitral valve; **Systolic anterior motion of the valve leaflets. Moderate mitral regurgitation**. E-wave 0.8 m/s; A-wave 0.5 m/s; Deceleration time 196 ms

AORTIC VALVE
Prosthetic aortic valve is well seated. Trivial paravalvular regurgitation.

LVOT: Max vel 5.0 m/s; Mean vel 3.5 m/s;
Max pressure gradient 100 mm Hg; Mean pressure gradient 49 mm Hg

AV: Max vel 5.1 m/s; Mean vel 3.7 m/s;
Max pressure gradient 104 mm Hg; Mean pressure gradient 55 mm Hg

TRICUSPID VALVE
Normal tricuspid valve. E-wave 0.3 m/s; Mild regurgitation; TR vel 2.0 m/s

PULMONIC VALVE
Normal pulmonic valve

Question 29

A pregnant patient requires prolonged mechanical ventilation in the ICU for a severe viral pneumonitis.

Outline the considerations required in the management of this patient for each stage of pregnancy:

a) First trimester (2 marks)

b) Second trimester (3 marks)

c) Third trimester (5 marks)

Question 30

Compare and contrast immunoglobulin therapy and plasma exchange for treatment of Guillain-Barré syndrome under the following headings:

a) Advantages (2 marks)

b) Disadvantages (2 marks)

c) Potential complications (5 marks)

d) Efficacy (1 mark)

END OF AFTERNOON PAPER