

Syllabus	ON PB_IK_19
Topic	Apnoea

a)

Write down the alveolar gas equation (1 mark)

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There are several factors that determine how long oxygen saturation is maintained during apnoea. These include; Functional Residual Capacity (FRC), alveolar oxygen content, and metabolic rate.

b)

Define FRC (1 mark) and give 3 possible causes of a reduced FRC (3 marks)

Definition:

Causes:

1)

2)

3)

Rate of oxygen consumption can alter the oxygen reservoir available during apnoea.

c)

Give 4 possible causes of increased oxygen consumption (4 marks)

1)

2)

3)

4)

d)

Describe in a stepwise-approach how elective pre-oxygenation is performed including how its adequacy is assessed (7 marks)

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e)

List 2 clinical advantages and 2 disadvantages of pre-oxygenating a fit adult? (4 marks)

	Advantage	Disadvantage
1)
2)

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	Answer	Marks	Guidance
a)	<ul style="list-style-type: none"> • $P_{A}O_2 = P_{i}O_2 - \frac{PaCO_2}{RQ}$ 	1	
b)	<ul style="list-style-type: none"> • FRC = ERV + RV <p><i>or</i></p> <ul style="list-style-type: none"> • Volume of gas that remains in lungs after NORMAL tidal expiration <p><u>Causes:</u></p> <ul style="list-style-type: none"> • Supine • Anaesthesia • Kyphoscoliosis • Pregnancy • Ascites • Bowel Obstruction • Age (lower in children) 	1 1 mark for each (Max. 3)	
c)	<ul style="list-style-type: none"> • Sepsis • Thyrotoxicosis • Pregnancy • Critical Illness • Fasciculations due to suxamethonium • Childhood 	1 mark for each (Max. 4)	
d)	<ul style="list-style-type: none"> • Explain + consent • Head-up tilt • Tight-fitting mask • 100% FiO2 • Gas flow to exceed patients MV • 5 minutes of tidal breathing • Monitor fraction of expired oxygen to target >0.9 	1 1 1 1 1 1 1	
e)	<p><u>Advantages</u></p> <ul style="list-style-type: none"> • Difficult to predict difficult intubation • Cannot predict severe laryngospasm <p><u>Disadvantages</u></p> <ul style="list-style-type: none"> • Prolongs induction • Intolerance – claustrophobia 	1 1 1 1	Marks for any sensible alternatives

<u>References</u>

1) Sirian R, Wills J. Physiology of apnoea and the benefits of preoxygenation. CEACCP (2009) 9(4)105–108 <https://academic.oup.com/bjaed/article/9/4/105/351542>