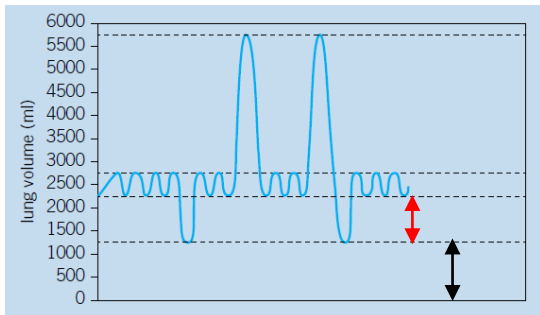


Question number	Answer	Marks	Guidance
1	D;	1	
2 (a)	fastest rate of air flow from lungs; indication of lung function;	2	
2 (b)	always higher for men; same pattern for men and women as age increases; (for both) initial increase in lung function; (for both) to a peak and then decreases; quote figures;	4	Max 4
2 (c)	line of the same shape but below bottom line (for men); asthma would lead to reduction in lung function; at all ages; (unlikely to be seen) as would normally be treated;	3	
2 (d)	<i>for inhalation</i> diaphragm contracts; requires, ATP / energy; <i>for exhalation</i> elastic recoil of lungs;	3	1 mark per point. Max 3
3 (a)	large surface area of lungs; ventilation/AW, maintains concentration gradient; blood flow maintains concentration gradient; thin alveolar wall;	3	Max 3
3 (b)	oxygen concentration lower in water than air; ORA operculum; ram ventilation / described; counter current mechanism / described;	3	
4 (a)	chitin;	1	
4 (b)	composed of monomers / repeating units; N-acetylglucosamine is the monomer;	2	
4 (c)	spiracles; trachea; lined within chitin to keep them open; tracheoles; run between /next to, individual cells; gaseous exchange between tracheoles and cells by diffusion;	4	Max 4
4 (d)	both held open by rigid material; to maintain air flow; chitin in insects; cartilage in mammals;	2	
5 (a)	$5.75 - 2.75 = 3000 \text{ cm}^3$; $2.75 - 2.25 = 0.50 \text{ cm}^3$;	2	
5 (b)	 <p>Shorter red arrow = expiratory reserve volume Longer black arrow = residual volume</p>	2	
5 (c)	tidal volume is higher during pregnancy; figures quote; expiratory reserve volume lower; more oxygen required for fetus; total lung volume / residual volume, decreased, due to space occupied by fetus;	6	