



MARKING SCHEME

**LEVEL 3 DIPLOMA/CERTIFICATE IN MEDICAL
SCIENCE - UNIT 6
4463U60-1**

SUMMER 2018

INTRODUCTION

This marking scheme was used by WJEC for the 2018 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

**WJEC DIPLOMA/ CERTIFICATE IN MEDICAL SCIENCE
MARK SCHEME- UNIT 6 MEDICAL CASE STUDY SUMMER 2018**

GENERAL INSTRUCTIONS

Recording of marks

Examiners must mark in red ink.

One tick must equate to one mark (apart from the questions where a level of response mark scheme is applied).

Question totals should be written in the box at the end of the question.

Question totals should be entered onto the grid on the front cover and these should be added to give the script total for each candidate.

Marking rules

All work should be seen to have been marked.

Marking schemes will indicate when explicit working is deemed to be a necessary part of a correct answer.

Crossed out responses not replaced should be marked.

Credit will be given for correct and relevant alternative responses which are not recorded in the mark scheme.

Marking abbreviations

The following may be used in marking schemes or in the marking of scripts to indicate reasons for the marks awarded.

cao	=	correct answer only
ecf	=	error carried forward
bod	=	benefit of doubt

Question			Answer	Marks	LO1	LO2	LO3	LO4	LO5						
1	(a)		Take a deep breath / Fill your lungs all the way.(1) Blow out as hard and fast as you can in a single blow. (1) + any 1 × (1) from: Move the marker to the bottom of the numbered scale. (1) Place the mouthpiece in your mouth/ between your teeth. Close your mouth (1)	3		3									
	(b)		Asthma patient peak flow will be reduced on exposure to trigger (reduced PEF is reversible) / improves on use of inhaler or medication (1)	1				1							
	(c)	(i)	$\frac{2.4 (1)}{3.8 (1)}$ = 63 / 63.16 / 63.2% (1) (ecf)	3		3									
		(ii)	Stage 2 or moderate COPD (1);(allow ecf) FEV ₁ % = 50-70%/moderate airflow limitation / shortness of breath / frequent episodes of breathlessness even on mild exertion (1)(ecf)	2	2										
2			<table border="1"><thead><tr><th>Difference</th><th>Explanation</th></tr></thead><tbody><tr><td>ref to flow rate- PEF is lower (1) or flow rate drops quicker</td><td>Airway is obstructed(blocked) – prevents airflow out of lung (1)</td></tr><tr><td>ref to volume -volume recorded is less (1)</td><td>Airway collapses – less air is expelled or inhaled (1)</td></tr></tbody></table> AVP	Difference	Explanation	ref to flow rate- PEF is lower (1) or flow rate drops quicker	Airway is obstructed(blocked) – prevents airflow out of lung (1)	ref to volume -volume recorded is less (1)	Airway collapses – less air is expelled or inhaled (1)	4		4			
Difference	Explanation														
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Question			Answer	Marks	LO1	LO2	LO3	LO4	LO5
3	(a)		dilates (widens) /bronchioles/airway(1) relaxes <u>muscles</u> (1) increase air flow(1)	3				3	
	(b)		reduces inflammation/swelling (in the bronchioles) (1) increase airflow (1)	2				2	
4	(a)		58 – 19 = 39 (1) 39% of £1.8 billion = £702 million OR correct % (1) 58% × £1.8 Billion = £1.044 Billion 16% + 3% = 19% × £1.8 Billion = £0.342 Saving = £1.044 - £0.342 = £0.702 Billion or 702 million (1)	2				2	
	(b)		Increase age – increase in chance of COPD (1) Increased smoking – increased chance of COPD (1)	2	2				
	(c)		Any 2 × (1): Population is aging / people living longer (1) Improved diagnosis (1) Increasing population(1) Increased cost of medication(1)	2	2				
5			Nicotine {patches/replacement therapies} (to reduce addictive component of smoking) (1)	1				1	
Total Case Study 1				25	6	10	0	9	0

Question			Answer	Marks	LO1	LO2	LO3	LO4	LO5
6			Any 2 × (1) from: raised temperature/warm (1) high humidity/ wet feet (1)	2	2				
7	(a)	(i)	there will be no significant difference (in the infection rates)	1			1		
		(ii)	Advantage: should get representative sample which is large enough/ accept not biased (1) Disadvantage: need to know people in target group before-hand / ORA (1)	2			2		
	(b)		Any 2 × (1) from: Males have greater infection rate throughout study (1) Increased infection (in males and females) with age until 50 years (1) Infection rate drops (in both male and female) after 50 (1) Accept: In both genders – as get older more complication from fungal nail infection (1)	2			2		
8	(a)		Fewer leukocytes to fight infection	1	1				
	(b)		Any 1 × (1) from: Transplant patients (1) Leukemia (1) Chemo / radio therapy (1) HIV/AIDS (1)	1	1				
	(c)		Any 2 × (1) from: Fungal infections can lead to (secondary) bacterial infections in the foot (1) Diabetes patients have reduced blood flow (at periphery) (1) Which can cause serious bacterial infection in the foot – gangrene(1) Resulting in amputations (1)	2				2	

Question			Answer	Marks	LO1	LO2	LO3	LO4	LO5						
9	(a)	(i)	Self-administration/ applied directly/applied locally/non-invasive (1) reduces side effects (1)	2				2							
		(ii)	difficult to control dose (1) irritation/rash/sting (1)	2				2							
		(iii)	intra-venous or iv (1) oral / sub-lingual (1) not: pessary or as a suppository	2				2							
	(b)	(i)	Steroid	1	1										
		(ii)	causes holes to appear in the fungal cell membrane/or weakens membrane/affects fluidity (1) substances enter the cells and/or the contents of the cells from leak out. (1)	2				2							
10			<table><tr><td></td><td>Allow shoes to dry out after being worn, this reduces moisture (1)</td></tr><tr><td></td><td>Towels may contain fungi from other people.(1)</td></tr><tr><td></td><td>Fungi remain in flakes of skin in unwashed socks/ reduce moisture (1)</td></tr></table>		Allow shoes to dry out after being worn, this reduces moisture (1)		Towels may contain fungi from other people.(1)		Fungi remain in flakes of skin in unwashed socks/ reduce moisture (1)	3				3	
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	Towels may contain fungi from other people.(1)														
	Fungi remain in flakes of skin in unwashed socks/ reduce moisture (1)														
11			0.5 × 2 (daily) × 14 (duration) = 14g (1) 2 tubes × £4.09 = £8.18 (1) (Accept £7.63)	2			2								
Total Case Study 2				25	5	0	7	13	0						

Question			Answer	Marks	LO1	LO2	LO3	LO4	LO5
12	(a)		Any 2 × (1) from: Four polypeptides / (alpha and beta) tertiary (1) joined by named bond (1) haem group (1)	2	2				
	(b)	(i)	Any 2 × (1) from: (Relatively) low cost (1) Very sensitive/measures low concentrations (1) Highly specific (1)	2					2
		(ii)	Any 9 × (1) from: • A: RIA -known quantity of antigen (1) • B: is made radioactive (1) • C: Mixed with <u>known quantity</u> of antibody (1) • D: Antigen (radioactive/labelled) and antibody bind together (1) • E: Sample (of serum) from patient (1) • F: Unlabelled patient antigen competes with radio-active (labelled) antigen (1) • G: Antigen and antibody binds(1) • H: Higher concentration of unlabelled patient antigen displaces more radioactive (labelled) antigen (1) • I: Bound antigens are separated from unbound antigens (1) • J: Radioactivity of bound antigens recorded/measured(1) • K: Concentration of unlabelled antigen found by calibration curve. (1) • L: decrease in activity • M: the activity will be in proportional to concentration of ferritin (1) O: In correct sequence (1)	10					10

Question			Answer	Marks	LO1	LO2	LO3	LO4	LO5
	(c)	(i)	measure of the spread or dispersion around a mean.	1			1		
		(ii)	6 correct plots $\pm$ <1 square tolerance (2) 5 correct plots $\pm$ <1 square tolerance (1) 4 or fewer correct plots $\pm$ <1square tolerance (0) Straight line (1)	3	3				
		(iii)	mean = 2.372 concentration from graph = 8.40 ($\pm$ 0.2) (1) (ecf)	1	1				
13			Any 2 $\times$ (1) from poor public health (1) unbalanced diets /malnutrition (1) higher pregnancy rate(1) AVP	2	2				
14	(a)		an increase in cardiac output more anaemic patient is.(1) output at rest in anaemic adults begins to increase when the haemoglobin drops (below 7/8 g/100 cm ³)(1)	2	2				
	(b)		Less 'oxygen' is being made available (per contraction) as less HB in blood. (1) Cardiac output increases to supply more blood flow (HB/O ₂) (1)	2	2				
Total Case Study 3				25	12	0	1	0	12