



MARKING SCHEME

SUMMER 2019

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

INTRODUCTION

This marking scheme was used by WJEC for the 2019 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 2019

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

Case study 1			Answer	Marks	LO1	LO2	LO3	LO4	LO5
1	(a)		pH 1-3/low pH – optimum pepsin/ trypsin inactive pH7-9(1) stomach (1)	2	2				
			pH 7-9 – optimum for trypsin / pepsin inactive pH1-3 (1) Duodenum / <u>small</u> intestine (1)	2	2				
	(b)	(i)	Endopeptidases - breaks peptide bonds other than terminal ones / breaks bonds in the middle of the chain Exopeptidases – breaks terminal peptide bonds / breaks bonds at the end	2	2				
		(ii)	Endopeptidases break up polypeptide into small chains (1) more ends for exopeptidase to digest (1)	2	2				
2	(a)		Increase in infection rates with age (1) Increase infection rates in India (1) Accept converse	2			2		
	(b)		More chance of exposure to <i>H. pylori</i> as you get older (1) More chance of exposure to <i>H. pylori</i> if eat uncooked food/ref to hygiene (1)	2			2		
3			PPI – reduce the formation of HCl in stomach / blocks proton pump (so less transport of H ⁺) Antacids – neutralize the (excess) acid in the stomach	2				2	

Case study 1			Answer	Marks	LO1	LO2	LO3	LO4	LO5
4	(a)		Sedative – calming/relaxing affects on patient / reduces gag reflex / reduce stress(1) Local anaesthetic – numb local area / not feel pain (1)	2				2	
	(b)		Any 4 × (1) from: A (long, thin flexible tube) was inserted into the mouth/nose/oesophagus (1) NOT trachea directed to the stomach (via oesophagus) (1) The end of the tube was equipped with a (light source and a small) camera (1) Observation (and measurements) of stomach (wall) can be made. (1) also equipped with a (small claw-like structure) to obtain a biopsy if required. (1)	4		4			
	(c)	(i)	Lidocaine	1				1	
		(ii)	Fast acting (onset is quick) (1) Last up to 60 minutes (as procedure takes 20 mins)	2				2	
		(iii)	Harold is (110-12) = 98 kg (1) × 3 mg = 294 mg (1)	2				2	
Total Case Study 1				25	8	4	4	9	0

Case study 2 Question No.			Answer	Marks	LO1	LO2	LO3	LO4	LO5									
5	(a)		(Gene/disease) linked to the sex /X chromosome	1	1													
	(b)		Phenotypes of parents – normal male XY – normal female X^dX (1) <table border="1"><tr><td></td><td>X</td><td>Y</td></tr><tr><td>X^d</td><td>X^dX</td><td>X^dY</td></tr><tr><td>X</td><td>XX</td><td>XY</td></tr></table> Probability – 25% / 1:4 (1)(ecf) Allow X ^D as unaffected		X	Y	X ^d	X ^d X	X ^d Y	X	XX	XY	3	3				
	X	Y																
X ^d	X ^d X	X ^d Y																
X	XX	XY																
6	(a)		Any 10 × (1) from: • Allows small sections of DNA (1) • to be amplified (rapidly) (1) • Using a primer / single stranded section of DNA (1) • Length of primer 6-25bp (1) • Heating DNA to 95°C (accept 90-99)(1) • to separate two strands (1) • Cooled to (50-60°C) (1) • allow primers to bind to the DNA strand /annealing(1) • Heating to 70°C (1) • thermally stable DNA (Taq) polymerase (1) • DNA polymerase adds nucleotides (1) • Complimentary to DNA/start of sequence being copied (1) • Bond formed with sugar phosphate back bone (1) • Cycle is repeated up {20-40 times/many times} (1) • {Millions/many} of copies of (target DNA/gene) from one piece produced (1)	10	2				8									

Case study 2 Question No.			Answer	Marks	LO1	LO2	LO3	LO4	LO5										
7	(a)		<table><tr><td>Difference from a normal ECG</td><td>Explanation or reason for change in ECG for DMD patient</td></tr><tr><td>Shortened PR interval</td><td>Conduction defect at AV node</td></tr><tr><td>Increased QRS duration</td><td>Conduction defect/fibrosis in bundle of his /purkinje tissue/ventricles (1)</td></tr><tr><td>Prolonged QT interval</td><td>Defect in repolarization (of ventricles) (1)</td></tr><tr><td>Tachycardia</td><td>Increased heart rate (due to reduced cardiac output) (1)</td></tr></table>	Difference from a normal ECG	Explanation or reason for change in ECG for DMD patient	Shortened PR interval	Conduction defect at AV node	Increased QRS duration	Conduction defect/fibrosis in bundle of his /purkinje tissue/ventricles (1)	Prolonged QT interval	Defect in repolarization (of ventricles) (1)	Tachycardia	Increased heart rate (due to reduced cardiac output) (1)	3		3			
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	(b)		Any 2 × (1) from: enlarged atria (1) enlarged ventricles (1) thinner <u>walls</u> (1)	2	2														
8			(Both) reduce blood pressure (1) <u>ACE</u> decreases angiotensin II / blood vessels dilate (1) <u>Beta blockers</u> : reduce the effect of adrenaline / reduce force of contraction (and arrhythmias)/control heart rhythm (1)	3				3											
9			David is at stage 5 (1) Any 2 × (1) from: limb function limited use of electric wheel chair (1) scoliosis present ref to operation (1) respiratory impairment with intervention at night (1) dysphagia eating meals (1) cardiac problems cardiomyopathy (1) If stage 4 chosen, allow last 2 marking points for spinal surgery and heart failure interventions	3		3													
Total Case Study 2				25	8	6	0	3	8										

Case study 3 Question No.			Answer	Marks	LO1	LO2	LO3	LO4	LO5
10			(Abnormal) immune response qualified (1) to a {normal /healthy/ unaffected} organ/tissue (1)	2	2				
11	(a)		Contains amine/ NH ₂ (1) Contains carboxyl / COOH (1)	2	2				
	(b)		It is in the diet/ingested/eaten	1	1				
	(c)	(i)	C, B, A, D E 3/4 correct (2), 1/2 correct (1)	2					2
		(ii)	Any (1) from: (Very) sensitive (1) Cost effective <u>in the long term</u> (1) Relatively quick (1)	1					1
		(iii)	radiation hazard/ pathogens from blood	1					1
12	(a)	(i)	There is no <u>significant</u> difference in (the prevalence of hypothyroidism in males and females)	1			1		
		(ii)	Reject (1) critical value (10.45) is greater than p (0.05) = 3.84(1)	2			2		
	(b)		Any 3 × (1) from: Females have greater incidence rate throughout study (1) Increased incidence rate with age throughout study (1) Female prevalence increases with age at faster rate (1) Male prevalence doesn't increase until {after 35 / at 45} years of age (1)	3			3		

Case study 3 Question No.			Answer	Marks	LO1	LO2	LO3	LO4	LO5
13	(a)		$\frac{365}{28} = 13.04$ (1) 14 blister packs – $(7 \times £1.12 + 7 \times £1.23)(1)$ $= (£7.84 + £8.61) = £16.45$ (1) IF For 12 months: $(6 \times £1.12 + 6 \times £1.23)(1)$ $= £14.10$ (1) IF 13 months are split into 2×6.5 : $(6 \times £1.12 + 6.5 \times £1.23)(1)$ $= £15.27/15.28$ (1) ALLOW $£15.28$ (3)	3				3	
	(b)	(i)	Any $2 \times (1)$ from: Less visits to GP/ less cost to patient (1) travel time/cost/difficult to access clinic (1) difficult for disabled patients to visit GP / doesn't interfere with patient holidays / doesn't interfere with work (1)	2				2	
		(ii)	less wastage of drugs so saves money (1) more monitoring of patient (1) reduced non-adherence (1)	1				1	
	(c)	(i)	reduces the production of T4 in thyroid /effect action of levothyroxine (1) stops the conversion of T4 to T3 (1)	1				1	
		(ii)	primary effect: depression/bipolar/schizophrenia/psychiatric medication(1) side effect: drowsiness/increased urination/hypothyroidism/tremors/ thrust /constipations / blurred vision / confusion (1)	2				2	
Total Case Study 3				25	5	0	6	10	4

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