



LEVEL 3 MARKING SCHEME

AUTUMN 2020

**LEVEL 3 DIPLOMA/CERTIFICATE IN MEDICAL
SCIENCE - UNIT 1
4463U10-1**

INTRODUCTION

This marking scheme was used by WJEC for the 2020 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 1 HUMAN HEALTH AND DISEASE AUTUMN 2020

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

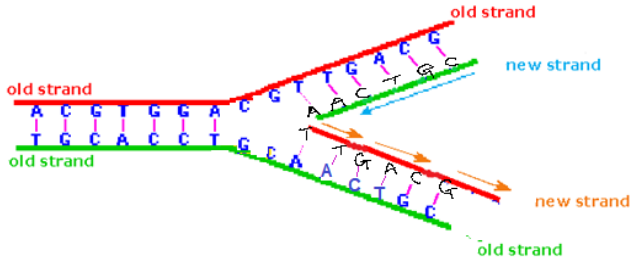
Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3									
1.			Any 3 for 1 mark: Sudden nosebleeds/ bleeding gums/ joint bleeds/ {muscle/soft-tissue} bleeds/ severe joint pain/ stiffness/severe bruising/joint deformity / prolonged bleeding/ spontaneous bleeding / internal bleeding	1			1												
2.			Sex-linked	1			1												
3.			padding / covers and protects the ends of (long) bones / cushion the joint / reduces friction during movement/ acts as a shock absorber	1		1													
4.			Mother XX^h Father X^hY 1 mark for gametes <table><tr><td>gametes</td><td>X^h</td><td>Y</td></tr><tr><td>X</td><td>XX^h</td><td>XY</td></tr><tr><td>X^h</td><td>X^hX^h</td><td>X^hY</td></tr></table> 1 mark for correct cross Probability: ¼, 1 in 4 / 25% 1 mark for probability	gametes	X ^h	Y	X	XX ^h	XY	X ^h	X ^h X ^h	X ^h Y	3			3			
gametes	X ^h	Y																	
X	XX ^h	XY																	
X ^h	X ^h X ^h	X ^h Y																	
5.			Lack of {clotting factor /factor VIII/factor IX} causes a weak platelet-thrombocyte plug to form. (1) Incomplete and/ or delayed fibrin clot allows bleeding to continue. (1)	2		2													

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
6.	(a)	(i)	Amino acid	1	1					
		(ii)	Peptide bond	1	1					
		(iii)	Dipeptide (1) Water (1)	2	2					
	(b)	(i)	Award 1 mark for any label to an α - helix or β - pleated sheet on the diagram.	1	1					
		(ii)	Any 2 for 1 mark: Disulfide bridge/ ionic/ hydrophobic/ hydrogen	1	1					
7.			Preventative - when medicine is used to prevent episodes of bleeding and other damage (1) On-demand - when medicine is used to treat an episode of prolonged bleeding (1)	2			2			
8.			Blood thinning medication (like heparin) decreases the body's ability to clot (1) As a haemophiliac already has difficulty blood clotting, the medication could make the condition worse (1)	2			2			

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
9.	(a)		Symptoms may be undetected / may not be detected until a trauma occurs (so not on register) (1) Progressive (1)	2				2		
	(b)		The total number of new haemophilia cases decreases (between 0-80+) (1) People are usually diagnosed when they are young so as age increases, the likelihood of the individual being diagnosed decreases/ more likely to die when older (1)	2				2		
	(c)	(i)	as most cases are diagnosed in children they will have a higher number of patients being treated for haemophilia / Higher population in London/May be referred from other areas of the UK as it is a specialist facility	1				1		
		(ii)	$1\,734\,750 / 62\,216\,990 \times 100$ (1) = 2.79 (1)	2				2		
Total Section A				25	6	3	9	7	0	0

SECTION B

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
10.	(a)		Set to 0 (1) Deep breath in (1) Exhale quickly and forcefully (1)	3					3	
	(b)		1 mark per test. Peak flow- errors can occur when patients use the equipment incorrectly / don't blow hard enough/ do not place lips around mouthpiece correctly/ forget to re-set the pointer on the device / bad seal around meter / bad posture when seated Blood Pressure- Using the incorrect cuff size / position of patients arm can affect the result / drinking coffee, smoke or carry out exercise before the reading can affect the reading. ECG- Results can be interpreted incorrectly if the patient is shivering etc these are shown on the ECG / difficult to place sensors.	3					3	
	(c)		Primary data: Data collected by the person carrying out the physiological measurement test. (1) Secondary data: Data collected by another person/ third party for the same use or for another purpose. (1)	2					2	
Total Question 10				8	0	0	0	0	8	0

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
11.	(a)		two new DNA molecules (1) each containing one original and one newly synthesized strand of DNA. (1)	2	2					
	(b)		new strands all correct. 	1	1					
	(c)	(i)	breaks the <u>hydrogen bonds</u> (1) between the bases in the helix, unwinding the DNA (1)	2	2					
		(ii)	(DNA polymerase) forms bonds (1) between adjacent nucleotides in the new strands of DNA. (1)	2	2					
Total Question 11				7	7	0	0	0	0	0

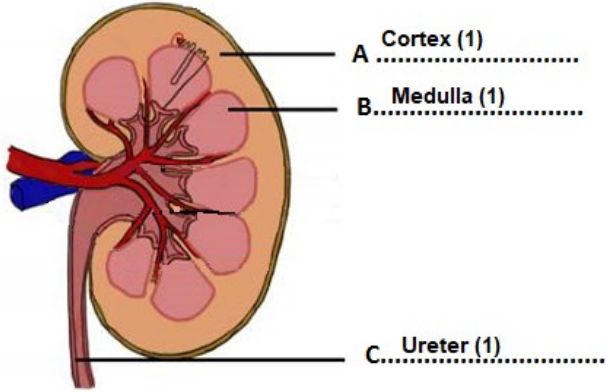
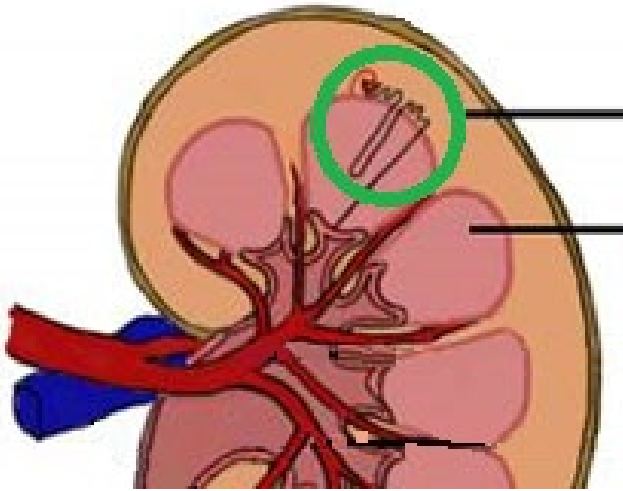
Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
12.	(a)		Where digestion is completed. – D (1) Produces pepsinogen – C (1) Site for mechanical digestion – A/C (1) Produces amylase A/E/D (1)	4		4				
	(b)		Emulsifies fats/ breaks down fat into smaller droplets / increases surface area / {increase/optimum} pH (1) for digestion by lipase. (1)	2		2				
	(c)		Lubrication of food for free movement (1) protects the wall of the stomach from acid secretions. (1)	2		2				
	(d)	(i)	Glycosidic bond	1	1					
		(ii)	Enzyme: lactase (1) Products: glucose (1) and galactose (1)	3	2	1				
Total Question 12				12	3	9	0	0	0	0

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
13.	(a)	(i)	Bacteria	1			1			
		(ii)	Transfer of bodily fluids/ sexually transmitted	1			1			
		(iii)	Any 2 × 1 from: infertility (1) discharge from penis/ vagina (1) pain during urination (1) pain during sex (1) bleeding between periods (1) tummy/ pelvis pain in women (1) pain in testicles (1) not: weakens immune system	2			2			
	(b)	(i)	130 -150 = -20 (1) -20/150 × 100 = -13 (1)	2				2		
		(ii)	• Bar chart (1) • Axes labelled (1) • Correct scale (must include negative values) (1) • Plots (1) allow ecf from calculation in b(i) for plot. Max 2 marks for line graph- axes (1), correct scale (1)	4						4
		(iii)	Abertawe Bro Morgannwg - decrease in % number of cases diagnosed for both males and females/ males have a greater % decrease than females Betsi Cadwalader - increase for both males and females/ female have a higher increase compared to males.	2				2		
Total Question 13				12	0	0	4	4	0	4

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
14.	(a)		Any 3 × 1 from: More people drink alcohol so higher number of problems. (1) Alcohol legally available so easier to get hold of. (1) Alcohol is more affordable than cannabis/cocaine so more people will misuse it. (1) Drinking alcohol is more socially acceptable and so is carried out more frequently in public causing more problems. (1)	3			2			
	(b)		Any 2 × 1 from: Dependency/ changes in hear rate/ paranoia/ changes in appetite/ weight loss/ changes in mood/ depression/ psychosis/ heart attack/ stroke/ cancer/ HIV/ infection caused by sharing needles/ AVP	2			2			
	(c)		1 mark from each of housing and employment: Housing: Poor housing could lead to depression which could lead to drug / alcohol use / Location of housing / housing near to known areas with a high incidence of drug use could lead to a further increase as they are more readily available / Shared housing could lead to an increase as more people are living in the same space which could cause influence / homelessness or lack of housing- alcohol or drug used as coping mechanism Employment: People in lower paid jobs could turn to drug / alcohol use as a coping mechanisms / depression caused by employment type/ physically demanding employment could cause an increase as pain relief / Unemployment could lead to increased drug/ alcohol use	2			2			

	(d)		Increase age / increase tax / reduce advertising / health warnings / greater use of drinkware labelling / education / homelessness or lack of housing- alcohol or drug used as coping mechanism	1			2			
Total Question 14				8	0	0	8	0	0	0

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
15.	(a)	(i)	the variable that is changed in an investigation / a variable whose variation is not dependent on any other variables.	1						1
		(ii)	Variables that are not intentionally studied in an investigation but could affect the outcome of the investigation / variable that cannot be controlled.	1						1
		(iii)	When individuals agree or disagree / volunteer to be part of the sample (therefore causing bias by their absence or presence.)	1						1
		(iv)	the hypothesis that there is no significant difference between populations, due to sampling or experimental error.	1						1
	(b)		Large sample size/random/representative of population	1						1
Total Question 15				5	0	0	0	0	0	5

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
16.	(a)	(i)	 A Cortex (1) B Medulla (1) C Ureter (1)	3		3				
		(ii)	1 mark for collect location of nephron 	1		1				
		(iii)	Urinary / excretory / accept endocrine	1		1				

Question No.			Answer	Marks	LO1	LO2	LO3	LO4	Unit 2	Unit 3
	(b)	(i)	Active transport	1	1					
		(ii)	Proximal convoluted tubule	1		1				
		(ii)	Osmosis	1	1					
	(c)		Any 5 × (1) from: ADH secretion is involved in negative feedback (1) restoring normal water concentrations in blood. (1) Osmoreceptors in hypothalamus. (1) Detect water concentration in blood. (1) ADH secreted by posterior pituitary gland. (1) ADH travels in blood stream to kidney / nephron (1) ADH causes change in permeability of collecting duct and distal convoluted tubule to water / ADH makes distal convoluted tubule and collecting duct more permeable to water. (1) Water is reabsorbed (into blood) by osmosis. (1) Concentrated urine produced. (1) ORA	5		5				
Total Question 16				13	2	11	0	0	0	0

UNIT 1 – HUMAN HEALTH AND DISEASE

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

Question	TOTAL MARK	LO1	LO2	LO3	LO4	Unit 2	Unit 3
Section A	25	6	3	9	7		
10.	8					8	
11.	7	7					
12.	12	3	9				
13.	12			4	4		4
14.	8			8			
15.	5						5
16.	13	2	11				
TOTAL	90	19	21	21	12	8	9
TARGET	90	18-23	18-23	18-23	10-15	8-12	8-12