

WJEC (Wales) Biology GCSE
Topic 2.7 Micro-organisms
and their Applications
Questions by Topic - Mark
Scheme

1.	Marking details	Marks Available
		6
	Indicative content	
	Aseptic collection of milk samples.	
	Flame loop.	
	Inoculating and plating samples on separate plates.	
	Sealing Petri dishes.	
	Incubation at stated correct temperature (20-25°C)	
	Stated time (12-24 hours).	
	Count colonies on plate with stale milk.	
	{No/fewer} {colonies/bacteria} in boiled milk.	
	5 – 6 marks	
	The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.	
	3 – 4 marks	
	The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.	
	1 – 2 marks	
	The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.	
	0 marks	
	The candidate does not make any attempt or give a relevant answer worthy of credit.	

2.

Question		Marking details (QER)	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
2	(a)	<p>Indicative content:</p> <ul style="list-style-type: none"> Working close to Bunsen flame/disinfect bench Label the base of the petri dish(es) to indicate antibiotics Flame forceps (then cool) Pick up each antibiotic disc in turn and place on agar surface Minimum lifting of lid /Seal dish with tape Incubate {for 2-3 days/ at 20 – 25 °C} (Observe results and) measure diameter of clear area around each disc compare the results for the antibiotic <p>5-6 marks At least seven correct points from indicative content</p> <p><i>There is a sustained line of reasoning which is coherent, relevant, supported by evidence and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</i></p> <p>3-4 marks At least four correct points from indicative content</p> <p><i>There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</i></p>	6			6		6
		<p>1-2 mark Any one correct point from indicative content</p> <p><i>There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</i></p> <p>0 marks: No attempt made or no response worthy of credit.</p>						
	(b)	<p>Improved hygiene practices/ named example e.g. {hand washing/ use of gels}/ thorough cleaning of hospital wards/ {isolation/ screening} of infected patients (1) Restraint in use of antibiotics {in hospitals/by doctors}/ owtte (1) Accept restraint in use of antibiotics in agriculture/ farming</p>	2			2		
Question 2 total			8	0	0	8	0	6

3.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a) i	1	B A D C	B in the top row, A in the second, D in the third C in the fourth		
ii	1	To prevent {entry / exit} of bacteria/ contamination by bacteria;	micro-organisms/ fungi/ microbes as alternative to bacteria		
(b) i	3	PLATE 1 10 °C; PLATE 2 4 °C; PLATE 3 35 °C;			
ii	1	7;			7 colonies
iii	2	<p>bacteria on the inoculating loop would not have been killed/ loop would not have been sterilised;</p> <p>therefore the agar would have {bacteria/ micro-organisms} growing on it which would have <u>not come from the milk</u>/ contaminated with bacteria <u>not from the milk</u>;</p> <p>OR</p> <p>the loop is flamed to ensure all micro-organisms on it are killed;</p> <p>only bacteria from the milk are grown;</p>	micro-organisms/ fungi/ microbes as alternative to bacteria		Loop not clean
Total Mark	8				

4.	Question	Marking details	Marks Available
	(a)	(i) (seen to be) red (hot)/ glows red; NOT hot unqualified/ orange/ white	1
		(ii) (Sterilisation) kills all bacteria/ no bacteria in agar; NOT stops other bacteria getting in	1
		(iii) Count colonies (in D);	1
	(b)	(i) 7; 2100; (ecf)	2
		(ii) I UHT II Traditional pasteurised } }	1
		(iii) Raw;	1

5.	Question	Marking details	Marks Available
5	(a)	(i) Increase then {plateau/steady/ OWTTE}; <i>NOT stops</i> Doubles up to 40 hrs/ 300 per mm ³ ;	2
		(ii) 270 - 220; (allow ecf) 50; (2 correct readings but incorrect subtraction – allow 1 mark) Correct answer = 2 marks	2
		(iii) {Initial increase in temperature / at 37} gives greater numbers; {Further increase in temperature /at 45} gives decreased numbers; Accept suitable alternative wording if clearly expressed NOT 'increase' unqualified	2
	(b)	Reproducibility; Accept to have increased confidence in results <i>NOT fair test</i>	1
	(c)	(i) Slows {bacterial/ <i>E.coli</i> } {growth/reproduction}; <i>NOT bacteria cannot grow</i>	1
		Question 5 Total	[8]

6.	Question	Marking details	Marks Available
6	(a)	Conclusion 1: No bacteria next to [Penicillium/fungus]/ clear area {by/ around} fungus/ bacteria only grow around edges; Conclusion 2: Effect decreases with distance from source/ effect decreases towards the edges/ clear area is circular;	2
	(b)	(i) antibiotic;	1
	(c)	any sensible aseptic method; <ul style="list-style-type: none"> • wash hands (a lot/regularly.....) • use of sterilising fluids/cloths • single use instruments/materials • use gloves • antibacterial gels • clean hospitals thoroughly • description of nurses uniform remaining in hospital NOT aseptic techniques unqualified	1
		Question 6 Total	[6]