OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



MARK SCHEME

B2.4 HOW CAN WE IDENTIFY THE CAUSE OF AN INFECTION? (HIGHER)

SCORE	PERCENTAGE
/15	%

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Question			Answer/Indicative content	Marks	Guidance
1			*Technique* Working under flame ✓ Use of alcohol / flame ✓ *For explanation* Prevents other bacteria colonising agar plate ✓ Kills other microorganisms ✓	2	ALLOW any correct technique Technique and explanation required for 2 marks DO NOT ALLOW two techniques for 2 marks
			Total	2	
2		i	Antigen is injected into the animal ✓ The antibody producing cells are taken from the animal ✓ The cells producing the correct antibody are then Selected and cultured ✓	3	All three stages needed for three marks
		ii	D B A C	1	
			Total	4	

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Question			Answer/Indicative content	Marks	Guidance
3		i	**Any two pairs of improvement + explanation from:** *improvement:* put on gloves before starting / disinfect the bench (with alcohol) before starting ✓ *explanation:* prevent/reduce risk of contaminating **sample/dish** ✓ *improvement:* use a wire loop to transfer bacteria from sample jar to dish ✓ *explanation:* can be flamed to prevent/reduce risk of contaminating **sample/dish** / regulates the amount of bacteria transferred to each **sample/dish** ✓ *improvement:* pass the neck of the jar through a flame before dipping wire loop in / pass wire loop through a flame (and allow to cool) before dipping into sample jar ✓ *explanation:* prevent/reduce risk of contaminating **sample/dish** ✓ *improvement:* idea of not taking lid fully off Petri dish ✓ *explanation:* prevent/reduce risk of contaminating **sample/dish** ✓ *improvement:* idea of working close to a (roaring) Bunsen flame ✓ *explanation:* prevent/reduce risk of aerial contamination of **sample/dish** ✓	4 (AO 3.3b × 4)	If only improvements given with no explanation, only a max. of 2 marks can be awarded **ALLOW** 'sets up a convection current' for explanation **Examiner's Comments** Aseptic techniques are a key element to one of the practical activities in section B2.4 of the specification and it was evident that many candidates were aware of methods involved. However, the explanations were not always linked to the improvements.
		ii	**FIRST CHECK THE ANSWER ON ANSWER LINE** $3.14 \times (23 \div 2)^2$ ✓ = 415.265 ✓ = 415 (to 3 s.f.) ✓	3 (AO 2.2 × 3)	**If answer = 415 award 3 marks** Most candidates were able to calculate the area of the clear zone. There were a number of common mistakes including the use of the diameter instead of the radius and giving the answer to 3 decimal places and not to 3 significant figures.

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Question			Answer/Indicative content	Marks	Guidance
		iii	Any two from: the bacteria are resistant to antibiotic **C** ✓ is not effective/does not kill the bacteria ✓ the solution of antibiotic **C** was too dilute ✓ the discs were soaked in only water by mistake ✓	2 (AO 3.2a × 2)	**DO NOT ALLOW** bacteria are tolerant or immune to antibiotic C **ALLOW** no antibiotic on disc / not enough antibiotic on disc Examiner's Comments Common mistakes involved the use of the word 'immune' when 'resistance' was required as well as the use of 'antibodies/antigens' instead of 'antibiotic'. Also some candidates wrongly referred to disc A as a placebo.
			Total	9	

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