OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



MARK SCHEME

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

SCORE	PERCENTAGE
/13	%

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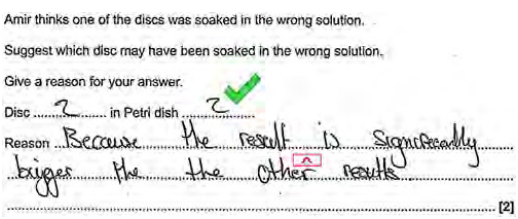
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Question			Answer/Indicative content	Marks	Guidance
1		i	**Any three from:** use aseptic technique(s) ✓ put on gloves before starting ✓ disinfect/sterilise the bench with alcohol before starting ✓ work next to a Bunsen burner (to create an updraft) ✓ pass the neck of the jar through a flame before dipping wire loop in ✓ pass the wire loop through a flame (and allow to cool) / sterilise the loop before dipping into sample jar ✓ idea of not taking lid fully off Petri dish / putting it back on quickly ✓ secure the Petri dish lid with Sello/sticky tape (following the inoculum spread) ✓	3 (AO 3.3b × 3)	**DO NOT ALLOW** "clean", as this may not be sterile **DO NOT ALLOW** "seal the Petri dish" <u>Examiner's Comments</u> Responses to this question suggested that most candidates were familiar with this kind of practical procedure, most likely through having done it themselves in a hands-on practical activity. Many candidates were able to give two or three correct examples of aseptic techniques. Some candidates needed to use scientific language such as 'disinfect' or 'sterilise' to score marks, rather than imprecise and everyday terms such as 'wipe', 'wash' and 'clean'. **AfL** The word 'clean' (as in "clean the wire loop") was not sufficient to score a mark. When learning about aseptic techniques and about the spread of diseases, there is an important distinction to make between 'clean' and 'sterile', because apparatus, surfaces, water, food, cooking utensils and hands can all look clean but be contaminated with pathogens, as most pathogens are too small to see.

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Question			Answer/Indicative content	Marks	Guidance
		ii	FIRST CHECK THE ANSWER ON ANSWER LINE If answer = 380 (mm2) award 3 marks 3.14×11^2 OR 3.14×121 OR $\pi \times 11^2$ ✓ = 379.94 ✓ = 380 (mm^2) ✓	3 (AO 2.2 × 3)	Award 2 marks for correct answer not given to 3 s.f. (i.e. 379.94) <u>Examiner's Comments</u> This calculation was generally well answered, but some candidates did not score the third mark because they did not give their (otherwise correct) answer to three significant figures.

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Question			Answer/Indicative content	Marks	Guidance
		iii	Disc 2 in Petri dish 2 ✓ **Plus any one from:** the area of the clear zone is much higher / outside the range of results for this disc in the other dishes / it is an outlier ✓ the area of the clear zone is in the range of results for disc 1 in the other dishes ✓ the area of the clear zone suggests it was soaked in antibiotic A ✓	2 (AO 3.2b) (AO 3.1b)	ALLOW Disc B in Petri dish 2 ALLOW same as disc 1 in dish 2 <u>Examiner's Comments</u> Many candidates needed to make clear which specific parts of the data they were referring to in order to score the reason mark. Exemplar 3  Amir thinks one of the discs was soaked in the wrong solution. Suggest which disc may have been soaked in the wrong solution. Give a reason for your answer. Disc 2 in Petri dish 2 Reason Because the result is significantly bigger the the other results [2] This candidate has identified the correct disc and dish for 1 mark, but does not get the mark for their reason. The candidate needed to refer to the other results 'for this disc' or 'for this antibiotic', or even 'in this row', rather than referring non-specifically to "the other results".
			Total	8	

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Question			Answer/Indicative content	Marks	Guidance
2		i	Any two from stem cells are unspecialised/undifferentiated ✓ (in the right conditions) stem cells can specialise / differentiate into cells that are needed ✓ stem cells can be used to replace damaged cells or tissues ✓	2 (AO 1.1 × 2)	ALLOW stem cells can develop into many different or any type of cell that is needed ALLOW specific examples of when stem cells are needed e.g. when a patient with leukaemia is given stem cells, they can specialise to grow new bone marrow IGNORE produce new body parts Examiner's Comments After correctly saying that stem cells are unspecialised many candidates did not get the second mark as they did not fully answer the question and explain why the cells are used in medicine. Although the term unspecialised was widely used, candidates did not seem to realise that this means that stem cells are able to specialise into cells that are needed. Some candidates were able to illustrate their answers with excellent examples of when stem cells are used in medicine and therefore did score the second mark. This question assessed objective AO1.
		ii	to reduce risk of contamination ✓	1 (AO 1.2)	IGNORE to keep it clean Examiner's Comments Less than half of candidates scored the mark here, mainly because they did not know what aseptic meant. Incorrect responses commonly suggested aseptic techniques are faster, safer or cleaner. This question assessed objective AO1.

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Question			Answer/Indicative content	Marks	Guidance
		iii	Bone marrow ✓ Embryos ✓	2 (AO 1.1 × 2)	 <u>Examiner's Comments</u> This AO1 question was very well answered with almost all candidates at least one mark (for embryos mainly). A common incorrect response was red blood cells.
		iv	results are looked at by other scientists or experts working in the field ✓ gives you greater confidence in or confirms the findings ✓	2 (AO 1.1 × 3)	IGNORE results are looked at by other people in the same field ALLOW to obtain more evidence / to ensure the data is accurate or repeatable or reproducible / to evaluate the work <u>Examiner's Comments</u> This AO1 question was answered correctly by around a third of candidates. Some candidates scored one mark, for being able to explain the purpose of peer review but few were able to describe the process of peer review, often re-wording the question for example "peer review is when a scientist's work is reviewed by a peer".
			Total	7	

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