AQA, OCR, Edexcel

A Level

A Level Biology

Microbiology Answers

Name:

MME
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Total Marks: /34

Microbiology

Answer	Marks
1. a) i) – cheap/inexpensive - Short life cycle - Grow/multiply quickly - Don't take up much space - Genome well understood.	2 marks
ii) Heterotroph – take in organic molecules and use them to make other molecules Autotroph- makes own food Obligate Anaerobe- only respire aerobically Acidophile- low optimum pH	4 marks
b) i) Autoclave	1 mark
ii) Any three from: -good personal hygiene -window and doors closed -plates and containers have lids on -keeping open samples close to a Bunsen flame -using sterilised wire a inoculating loops	3 marks
c) i) – identifying a disease -producing a useful substance like antibiotics -food production – cheese/wine	2 marks

ii) – Lag, Log/exponential, stationary, decline/death phases all correctly identified -Lag – small population starts to replicate slowly -Log-favourable conditions; large amount of food, low amount of competition -Stationary-reproductive rate and death rate are equal, food supply is small and waste products build up -Decline/death-death is greater than reproductive rate, food is depleted, waste builds up	5 marks
iv)Substance sometimes produced at the end of exponential phase that can help the bacteria survive in more stressful conditions	1 mark
v) – viewing a small sample of medium and viewing it under a microscope -number of cells can be counted using a haemocytometer -Repeated counts of the squares is carried out and an average is calculated.	3 marks
2. a) i) – more microorganisms can been grown in a shorter amount of time -conditions can be kept constant for optimum growth -conditions are sterile -conditions are constant between batches -conditions can be regulated and repeated	2 marks

ii) <u>Batch culture:</u>
- fixed volume of medium, oxygen is added and waste products are removed
<u>Disadvantage:</u> waste builds up and new cultures must used to start the process again
<u>Advantage:</u> Easy to control conditions and isn't expensive

<u>Continuous culture:</u>
-fresh medium is added at a constant rate so that cells are kept in exponential growth
<u>Disadvantage:</u> it is expensive to restart if contamination occurs
<u>Advantage:</u>
More productive and uses smaller containers

6 marks

ii

Continuous culture

No. of bacterial cells (Log)

Batch culture
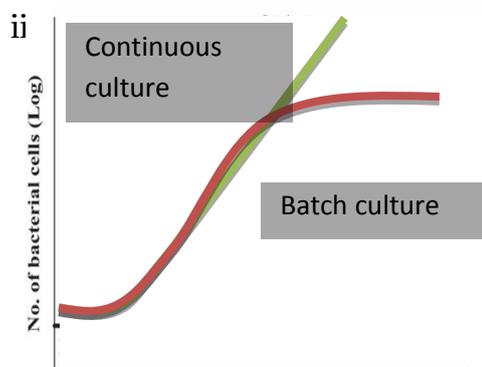
2 marks

b)
i) – Morally wrong to genetically modify any organisms
   -If organisms escaped into the wild they could interbreed with natural populations
   -Could have a long –term effect on the environment e.g. food webs
   -Genetically modified genes could have unforeseen effects on other genes

3 marks