

Y12 Applied general holiday homework

Research and write at least a paragraph on each of the following areas:

The main groups of microorganisms and their structure/function

Draw and label a diagram of an:

- Akaryote
- Prokaryote
- Eukaryote

Relate each of the features you have identified in the cell to it's function

Explain how microorganisms can be identified using:

- Gram staining
- Microscopy
- Colony characteristics

Explain why each of the above techniques can only be used on particular microbes, not all microbes

List and explain techniques that are used in biotechnological industries to identify microorganisms

Using aseptic technique to safely cultivate microorganisms

What is aseptic technique?

How could you produce a sterile growth medium for microbes to grow in?

List common risks associated with cultivating microorganisms and actions that you would take to control these risks.

Describe a method for cultivating 3 different types of microorganism using aseptic technique. Include how you would safely dispose of both equipment and the microorganisms.

Explain how to produce the following:

- Streak plates
- Lawn plates
- Pour plates
- Mycelial discs
- Viral plaque counts

Factors that affect the growth of microorganisms

Describe and explain how the following factors affect the growth of microorganisms:

- Temperature
- pH
- Aerobic conditions
- Anaerobic conditions
- Antibiotics
- Antivirals

- Disinfection
- Sterilisation
- Irradiation
- Osmotic potential
- Antimicrobials such as toothpaste, mouthwash or plant derivatives (eg lavender oil)

Explain how to use a haemocytometer

Describe how to complete a serial dilution

The use of microorganisms in biotechnological industries

Give examples of microorganisms used in biotechnological industries

Label a diagram showing the main features of an industrial fermenter (bioreactor)

Describe how industrial fermenters are used in biotechnological industries

Describe the following processes and techniques:

- Batch processing
- Continuous processing
- Microbial fermentation
- Immobilisation of enzymes
- Genetic engineering
- Biodegradation

Explain how microorganisms are used in the following industries;

- Food production
- Environmental health
- Pharmaceuticals
- Forensic science
- Agriculture
- Alternative energies
- Waste water treatment