



mini practice biol1007 exam with correct answers

From Molecules to Ecosystems (University of Sydney)



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- 60 multiple choice 4 short answer Q
- 2 per lecture 1 for each module
- some about practicals

BIOL1x07 Module 3 PRACTICE EXAM

Multiple Choice Questions: ~20 min

Short Answer Question: ~25 min

Total time: 45 min

Section 1: Multiple Choice Questions (14 marks)

9/14

1. What does 'normal microflora' mean?

- a) Microbes that are found only in one location in nature
- b) Microbes that do not cause disease in humans
- c) Microbes that are found everywhere in nature
- d) Microbes that are commonly associated with parts of the human body

2. What is an important component of the "One Health" philosophy?

- a) That human health is more important than animal or plant health
- b) That humans need to get sick sometimes to allow plants and animals to thrive
- c) That antibacterial compounds need to be used more widely to maintain health
- d) That the health of the environment directly impacts on human health

3. Which of the following statements is NOT TRUE about "Germ-free" cows.

"Germ-free" cows would not be able to survive because they would

- a) be too vulnerable to pathogens .
 - b) not be able to digest cellulose.
 - c) suffer from malnutrition.
 - d) rapidly fill up with methane.
- no microbes = no methane

4. Monocultures of plant crops are

- a) not financially sustainable because there is no cross-breeding
 - b) less fertile and productive
 - c) more vulnerable to new pathogens
 - d) less likely to have a normal microflora
- no normal microflora to protect themselves

5. The lichen symbiosis consists of which two partners?

- a) Bacteria and fungi
- b) Fungi and algae
- c) Protists and plants
- d) Plants and bacteria

→ mutualistic

Fungi
heterotroph

Algae
autotroph

provide nutrients
in the soil
(N₂)

→ use photosyn to produce
glucose

light + self feeding



6. Photoautotrophic bacteria:

- a) Use complex organic molecules as their primary carbon and energy sources.
- b) Use CO₂ as their carbon source and light as their energy source
- c) Use light as their energy source and organic molecules as their carbon source
- d) Use nitrate or ammonia as their energy source and organic molecules as their carbon source

this part
is not
true

7. What valuable resource do members of the Archaea offer for biotechnology?

- a) They make T4 ligase enzyme
- b) They are useful hosts for cloning and gene expression
- c) They make many antibiotics and other bioactive compounds
- d) They make thermostable enzymes like DNA polymerases

Archaea live in
extremely niche environments

↓
they can survive very
high temperatures

key hint that d was the correct answer →

8. Which of the following is an example of a "cloning vector"

- a) chromosomal DNA
- b) plasmid DNA
- c) genomic DNA
- d) messenger RNA

9. Read the following statements and choose the correct option below:

- A) Pasteur's experiment with the swan-necked flasks was important because it proved Koch's postulates
- B) Pasteur's work directly led to the invention of the microscope

pasteurisation

- a) A & B are both correct
- b) A is correct and B is incorrect
- c) A is incorrect and B is correct
- d) A & B are both incorrect

d is correct

→ Pasteur was responsible for many contributions to micro
biology: fermentation, vaccination, pasteurisation
→ disproved spontaneous generation in 1859

10. Which statement best describes the current situation with tuberculosis?

- a) This is an animal disease that does not usually cause problems for humans
- b) This is a very problematic disease that is often resistant to antimicrobials
- c) This is a new disease that is spread by contaminated water supplies
- d) This is a common disease, but the symptoms are mild, and it is readily treated

11. The normal microflora of animals

- a) is the same as the normal microflora for humans
- b) is the same as the normal microflora for plants
- c) under certain conditions can be pathogenic to the animal
- d) can never harm the animal

12. Pollutant-degrading bacteria typically belong to which of the following nutritional types or trophic group?

- a) Autotrophs
- b) Heterotrophs**
- c) Methanogens
- d) Primary producers**

form of autotrophs
inorganic sources to
→ Autotroph

Autotroph
= self feeding

pollutant degrading

= uses complex organic matter not light

bacteria use organic matter
∴ could be pollutant

13. Global warming is partly due to increased atmospheric levels of CO₂ and CH₄.

Which of the following microbes would be the most helpful in reducing global warming?

- a) Methanotrophs**
- b) Methanogens
- c) Decomposers
- d) Heterotrophs

14. Read the following statements and choose the correct option below:

- A. *E. coli* is widely used in recombinant DNA technology because it is generally regarded as safe (GRAS)
- B. T4 DNA ligase is an enzyme produced by T4 bacteriophage

- a) A & B are both correct**
- b) A is correct and B is incorrect
- c) A is incorrect and B is correct**
- d) A & B are both incorrect

A is incorrect

→ *E. coli* is very easy to work with to extract plasmid DNA
· fast growth time
· model organism

HOWEVER

→ yeast is what is "generally regarded as safe" because it is regarded as a eukaryote and more likely to be accepted by other eukaryotes, such as ourselves.
cells

↑
salmonella: chicken eggs

a) Food borne infection involves ingestion of pathogenic microbes that grow inside the human body → microbes grow in gut → leading to symptoms of disease due to toxin production.
Food borne intoxication is when the toxins are produced by the microbes in the food
→ microbes can't grow well in the food → *Clostridium botulinum*

b) Steps to reduce food poisoning exist at all stages of the supply chain including the origin (animals, plants, soil)

production → processing → distribution → consumption

one way to reduce the risk of food poisoning is to ensure good hygiene practice of the people responsible for handling food; unfortunately these factors are hard to control

Section 2: Short Answer Questions (12 marks)

- Describe the food-borne infection and food-borne intoxication (2 marks).
 - Outline one common way to reduce the risk of food poisoning and why it sometimes does not work (2 marks).
- Describe below four major types of microorganisms and the key features that distinguish them (8 marks).

Viruses : acellular entities that require a host cell for replication + metabolism

↳ steals nutrients + energy

Bacteria : smallest cellular organism that self replicate and unicellular have their own metabolism → unlike viruses no nucleus membrane or complex organelles (primary producers)

Fungi : large complex structures (eukaryotes) with complex organelles
↳ Both unicellular and multi cellular
Microscopic + Macroscopic features
• produce spores (decomposers)
• have fruiting bodies.

Protists : (protozoa) also large complex cells (eukaryotes) but they are capable of producing their own energy . photosynthetic (heterotrophs)
→ also can be predatory (protozoa)
huge diverse groups

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