

# Problem Set #1

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## Cell Biology

Question 1:

What is the approximate size of the following:

- a. E. coli
- b. Yeast
- c. Mammalian Cell
- d. Antibody
- e. Ribosome

Answer:

Question 2:

What are the volumes of E. coli, yeast, and a HeLa cell?

Answer:

Question 3:

What are the two main classes of bacteria and what differentiates them?

Answer:

Question 5:

Name one example of a Gram+ and one Gram – bacterium.

Answer:

Question 6:

What is the peptidoglycan layer primarily made of?

Answer:

Question 7:

What is the mode of action of a beta-lactam antibiotic?

- a) They bind to ribosomes and thus inhibit translation.
- b) They insert into the cell membrane and thus burst open the cells leading to cell death.
- c) They bind to penicillin binding proteins and inhibit peptidoglycan layer formation.
- d) They are generally toxic to all cells.

Answer:

Question 8:

What is required to fit a bacterial genome into a bacterial cell?

Answer:

Question 9:

How are plasmids transferred from one bacterium to another?

Answer:

Question 10:

What types of endoplasmic reticuli exist and what are their main functions?

Answer:

Question 11:

Which of the following transport mechanisms requires energy in the form of ATP?

- a) Simple diffusion
- b) Facilitated diffusion
- c) Primary active transport
- d) Secondary active transport

Answer:

Question 12:

What is endocytosis and name three endocytic pathways?

Answer:

Question 13:

Name the 3 structural components of the cytoskeleton.

Answer:

Question 14:

By what process do bacteria divide?

- a) Mitosis
- b) Binary fission
- c) Meiosis
- d) All of the above

Answer:

Question 15:

Number the following steps in Mitosis in the order in which they occur.

- \_\_\_ Anaphase
- \_\_\_ Metaphase
- \_\_\_ Prophase
- \_\_\_ Cytokinesis
- \_\_\_ Telophase

Answer:

Question 16:

What is the difference between mitosis and meiosis?

Answer: