Interactive Cell Biology 1st edition Catalano Test Bank

SKU: 9781319602314-TEST-BANK

Name:_____ Class:_____ Date:_____

Chapter 1

1. Which sentence applies only to living things and not to nonliving things?
   a. They are made of cells.
   b. They consume energy.
   c. They are composed of macromolecules.
   d. They can move.

ANSWER: a

2. Cells are the basic building blocks of life.
   a. true
   b. false

ANSWER: a

3. What is cell biology?

ANSWER: Cell biology is the study of how cells work.

4. Organisms exist in the state they are in today because of:
   a. a combination of both their DNA and their past.
   b. their past.
   c. their DNA.
   d. macromolecules.

ANSWER: a

5. How many centromeres are found on human chromosome 2?
   a. 2
   b. 1
   c. 3
   d. 0

ANSWER: a

6. Why does human chromosome 2 possess two centromeres instead of one and three telomeres instead of two?

ANSWER: Human chromosome 2 used to be two separate chromosomes that have fused together over the course of evolution. Further evidence of this comes from comparing the chromosomes of chimpanzees, our closest living relatives, to ours. In chimpanzees, these two chromosomes are separate.

7. Why was it originally thought that proteins moved from one static cisterna to the next via transport vesicles?

ANSWER: If we only observe static images of the Golgi apparatus, it's hard to see the manner in which proteins move through the Golgi apparatus. However, observing these events in motion makes it clear that proteins remain in the same cisterna while the cisternae themselves move through the stack (while vesicles move other proteins backwards).

8. Most of the cells in our body are about _____ in diameter.
   a. 30-40 μm

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

b. 300-400 µm
c. 30-40 nm
d. 300-400 nm

ANSWER: a

9. There are _____ nm in 1 µm.
a. 1000
b. 1,000,000
c. 100
d. 10

ANSWER: a

10. There are _____ nm in 1 mm.
a. 1,000,000
b. 1000
c. 100
d. 10

ANSWER: a

11. The cellular world exists mostly on the scale of _____ while the macromolecular world exists mostly on the scale of _____.
a. µm; nm
b. nm; µm
c. mm; µm
d. µm; mm

ANSWER: a

12. The cellular world is not related to the macromolecular world in any way.
a. true
b. false

ANSWER: b

13. Organelles and macromolecules are discrete objects that are separate from one another, so the spatial relationship between them cannot be shown.
a. true
b. false

ANSWER: b

14. The shape of the mitochondrial cristae is caused by:
a. ATP synthase dimers.
b. the inner mitochondrial membrane.

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

c. the outer mitochondrial membrane.
d. ATP.

ANSWER: a

15. What are cristae?

ANSWER: Cristae are sheet- and tube-like infoldings of the inner mitochondrial membrane that significantly increase the surface area of the inner membrane while maintaining a relatively small intermembrane volume. The proteins embedded in the cristae membrane are fundamental to cellular respiration.

16. What were the first organisms to evolve on Earth?
a. Bacteria
b. Archaea
c. Eukaryotes
d. Eukarya

ANSWER: a

17. Life first evolved on Earth around 3.9 _____ years ago.
a. billion
b. million
c. trillion
d. thousand

ANSWER: a

18. Eukaryotes evolved from:
a. archaea.
b. bacteria.
c. eukarya.
d. abiogenesis.

ANSWER: a

19. Bacteria are usually about _____ eukaryotic cells.
a. 10 times smaller than
b. 10 times bigger than
c. the same size as
d. 100 times smaller than

ANSWER: a

20. Humans have more bacterial cells in and on their bodies than human cells.
a. true
b. false

ANSWER: a

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

21. Bacteria and archaea are found:
    a. in virtually every imaginable habitat on Earth.
    b. in only a few select habitats on Earth.
    c. only in bodies of water.
    d. in most bodies of water and in some habitats on land.

ANSWER: a

22. Which type of organism has species that can live in nuclear waste?
    a. archaea
    b. bacteria
    c. eukaryotes
    d. fungi

ANSWER: a

23. Which of the following organisms are morphologically most similar to each other?
    a. bacteria and archaea
    b. bacteria and eukaryotes
    c. archaea and eukaryotes
    d. archaea and organelles

ANSWER: a

24. Eukaryotes possess a nucleus, whereas prokaryotes do not.
    a. true
    b. false

ANSWER: a

25. The prokaryote/eukaryote classification system is:
    a. not representative of evolutionary relationships.
    b. strongly based on evolutionary relationships.
    c. loosely based on evolutionary relationships.
    d. not representative of morphological similarities and differences.

ANSWER: a

26. Which domain of life possesses lipid membrane-bound organelles?

ANSWER: eukaryotes

27. Almost every prokaryotic cell possesses:
    a. a cell wall.
    b. a nucleus.
    c. two cell membranes.
    d. organelles.

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

ANSWER: a

28. Most prokaryotic cell walls are composed of:
    a. polysaccharides.
    b. nucleic acids.
    c. lipids.
    d. proteins.

ANSWER: a

29. Most bacterial cell walls are composed of:
    a. peptidoglycan.
    b. cellulose.
    c. lipids.
    d. carboxysomes.

ANSWER: a

30. Most plant cell walls are composed of:
    a. cellulose.
    b. peptidoglycan.
    c. lipids.
    d. carboxysomes.

ANSWER: a

31. Gram-negative bacteria possess _____ cell membrane(s).
    a. 2
    b. 1
    c. 0
    d. 3

ANSWER: a

32. Prokaryotes segregate intracellular processes by using organelles to regulate the entry or exit of molecules and macromolecules.
    a. true
    b. false

ANSWER: b

33. The carboxysome is:
    a. an intracellular compartment found in some prokaryotes.
    b. an intracellular compartment found in some eukaryotes.
    c. an extension of the cell membrane in some prokaryotes.
    d. an extension of the cell membrane in some eukaryotes.

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

ANSWER: a

34. In prokaryotes, DNA interacts with proteins to form a region called the:
    a. nucleoid.
    b. nucleus.
    c. nucleic acid.
    d. carboxysome.

ANSWER: a

35. All eukaryotes are multicellular organisms, but not all multicellular organisms are necessarily eukaryotes.
    a. true
    b. false

ANSWER: b

36. Many single-celled eukaryotes:
    a. prey on smaller prokaryotes.
    b. prey on each other.
    c. lack a nucleus.
    d. lack most intracellular organelles.

ANSWER: a

37. Eukaryotic genomes are usually composed of:
    a. multiple linear DNA macromolecules.
    b. a single linear DNA macromolecule.
    c. multiple circular DNA macromolecules.
    d. a single circular DNA macromolecule.

ANSWER: a

38. Most fungal and plant cells possess a cell wall.
    a. true
    b. false

ANSWER: a

39. How do eukaryotic cells that do not have cell walls maintain their structural integrity?

ANSWER: Eukaryotes that do not have cell walls have cytoskeletons, which are a network of long, fibrous proteins that give strength and shape to a cell.

40. Single-celled eukaryotes are morphologically very diverse.
    a. true
    b. false

ANSWER: a

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

41. Some single-celled eukaryotes:
    a. can perform photosynthesis.
    b. possess a nucleoid.
    c. are more closely related to archaea than they are to other single-celled eukaryotes.
    d. possess carboxysomes.

ANSWER: a

42. Why are single-celled eukaryotes often used as models to study multicellular life?

ANSWER: Single-celled eukaryotes are much simpler than their multicellular counterparts. We can learn a lot about multicellular organisms and even life in general by taking some time to simply observe single-celled eukaryotes under the microscope. What we see is a collection of molecules and macromolecules that somehow all work together in synchrony to create life.

43. Cells exhibit _____ amount of morphological diversity.
    a. a high
    b. a low
    c. a moderate
    d. no

ANSWER: a

44. The morphological diversity of cells translates into functional diversity.
    a. true
    b. false

ANSWER: a

45. All cells possess:
    a. a lipid membrane.
    b. a nucleus.
    c. a cell wall.
    d. organelles.

ANSWER: a

46. All cells are made from the same five types of biological molecules.
    a. true
    b. false

ANSWER: b

47. Which of the following is NOT a type of biological molecule that is used to build cells?
    a. iron
    b. carbohydrates
    c. amino acids
    d. nucleotides

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

ANSWER: a

48. Which of the following is NOT a type of microscope that is typically used to study cells?
    a. dissecting microscopes
    b. light microscopes
    c. fluorescence microscopes
    d. electron microscopes

ANSWER: a

49. Most light microscopes use:
    a. visible light.
    b. fluorescent light.
    c. electrons.
    d. protons.

ANSWER: a

50. Fluorescence microscopes use:
    a. UV light.
    b. visible light.
    c. electrons.
    d. protons.

ANSWER: a

51. Which of the following can produce 3D images?
    a. confocal microscopes
    b. light microscopes
    c. proton microscopes
    d. fluorescence microscopes

ANSWER: a

52. Light and fluorescence microscopes allow us to see cells, organelles, and macromolecules.
    a. true
    b. false

ANSWER: b

53. Which of the following microscopes can produce a 2D image that is representative of a thinly-sliced plane within a sample?
    a. TEM
    b. SEM
    c. REM
    d. QEM

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank

Chapter 1

ANSWER: a

54. Which of the following microscopes can produce an image that is representative of the surface topography of a sample?
    a. SEM
    b. TEM
    c. REM
    d. QEM

ANSWER: a

55. As powerful as electron microscopes are, they still do not allow us to observe even large macromolecules.
    a. true
    b. false

ANSWER: b

56. Why does SEM produce a representative image of the surface topography of a sample?

ANSWER: The electron detector in SEMs capture electrons that deflect off of the sample surface rather than the electrons that pass through the sample. The result is a highly magnified image that shows the surface topography of the sample.

57. Which of the following techniques is NOT able to achieve atomic level resolution?
    a. TEM
    b. cryo-EM
    c. NMR
    d. X-ray crystallography

ANSWER: a

58. The broad steps used in X-ray crystallography are (in order) to produce a protein, crystalize a protein, shoot the crystal with X-rays, and then determine the protein structure from the diffraction pattern.
    a. true
    b. false

ANSWER: a

59. What is the purpose of cryogenic electron microscopy (cryo-EM)?

ANSWER: Cryo-EM uses a sample that is cooled to cryogenic temperatures and images it in multiple ways to reconstruct its three-dimensional structure.

Copyright Macmillan Learning. Powered by Cognero.

Interactive Cell Biology 1st edition Catalano Test Bank