Package Title: Test Bank
Course Title: Karp9e
Chapter Number: 1

Question Type: Multiple Choice

1) Who was the first person to name what he thought were single cells?

a) Leeuwenhoek
b) Hooke
c) Schleiden
d) Schwann
e) Virchow

Answer: b

Difficulty: Easy
Learning Objective: LO 1.1 Identify the three tenets of cell theory.
Section Reference: Section 1.1 The Discovery of Cells

2) The first compound light microscopes were constructed by the end of the sixteenth century. What characteristic defines a compound microscope?

a) It has a moveable stage.
b) It has multiple lenses.
c) Its lens is double the size of simple microscopes.
d) The lens has two different colors.
e) It has two different light sources.

Answer: b

Difficulty: Easy
Learning Objective: LO 1.1 Identify the three tenets of cell theory.
Section Reference: Section 1.1 The Discovery of Cells

3) Who was the first scientist to examine and describe living cells?

a) Leeuwenhoek

b) Hooke
c) Schleiden
d) Schwann
e) Virchow

Answer: a

Difficulty: Easy
Learning Objective: LO 1.1 Identify the three tenets of cell theory.
Section Reference: Section 1.1 The Discovery of Cells

4) Who is generally credited with the discovery of cells?

a) Leeuwenhoek
b) Hooke
c) Schleiden
d) Schwann
e) Virchow

Answer: b

Difficulty: Easy
Learning Objective: LO 1.1 Identify the three tenets of cell theory.
Section Reference: Section 1.1 The Discovery of Cells

5) Despite being correct about the first two tenets of the Cell Theory, Schleiden and Schwann made an error about another central feature of cells. What was their mistaken claim?

a) They believed that all cells were smaller than 2 μ in diameter.
b) They claimed that all cells were exactly the same in every detail.
c) They described cells as immortal.
d) They agreed that cells could arise from noncellular materials.
e) They stated that all cells had nuclei through their entire existence.

Answer: d

Difficulty: Medium
Learning Objective: LO 1.1 Identify the three tenets of cell theory.
Section Reference: Section 1.1 The Discovery of Cells

6) Which of the following characteristics is NOT a basic property of cells?

a) Cells carry out a variety of emotional reactions.
b) Cells engage in numerous mechanical activities.
c) Cells generally respond to stimuli.
d) Cells are capable of self-regulation.
e) Cells evolve.

Answer: a

Difficulty: Easy
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

7) Which of the following statements accurately characterize cells?

a) Cells are highly complex and organized.
b) Cells possess a genetic program and the means to use it.
c) Cells are capable of producing more of themselves.
d) Cells acquire and utilize energy.
e) All choices are correct.

Answer: e

Difficulty: Easy
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

8) The first culture of human cells was begun by George and Martha Gey of Johns Hopkins University in 1951. The cells were obtained from a malignant tumor and named _____ cells after the donor, _____.

a) MaLe, Mary Leeds
b) HeLa, Henrietta Lacks
c) Roberts, John Roberts
d) MaLe, Martin Lewis
e) HeLa, Helen Lassiter

Answer: b

Difficulty: Medium
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

9) Cells grown in culture, outside the body are described as cells grown _____.

a) *in vivo*
b) live
c) *in vitro*
d) *in culturo*
e) vivacious

Answer: c

Difficulty: Medium
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

10) A high powered microscope that allows cellular organelles to be examined in great detail is called _____.

a) a refractive microscope
b) an electron microscope
c) a fluorescence microscope
d) a scanning tunneling microscope
e) a confocal laser scanning microscope

Answer: b

Difficulty: Easy
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

11) Which list shows the correct order for cellular complexity from largest to smallest units?

a) organelles, polymers, atoms, complexes, molecules
b) organelles, complexes, polymers, molecules, atoms

c) organelles, molecules, complexes, atoms, polymers
d) organelles, atoms, molecules, complexes, polymers

Answer: b

Difficulty: Easy
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

12) The apical ends of intestinal cells face the intestinal channel and have long processes that facilitate the absorption of nutrients. What is the name of these processes and what cytoskeletal element forms their internal skeleton?

a) microvilli, microtubules
b) villi, microtubules
c) microvilli, actin filaments
d) villi, actin filaments
e) microvilli, intermediate filaments

Answer: c

Difficulty: Medium
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

13) Virtually all chemical changes that take place in cells require _____, molecules that greatly increase the rate at which a chemical reaction occurs.

a) DNAs
b) carbohydrates
c) ligands
d) enzymes

Answer: d

Difficulty: Easy
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

14) You are conducting an experiment by trying to reproduce the work performed in 1891 by Hans Driesch, a German embryologist. Working with a fertilized sea urchin egg, you allow it to complete the first cell division after fertilization. You then carefully separate the two cells of the embryo and allow their development to continue. Based on Driesch's experiment, which result below would you expect to happen?

a) Both of the cells will die.
b) Both of the cells will develop into complete and normal embryos.
c) One cell will develop into a normal, though smaller, embryo; the other dies.
d) One cell will develop into half an embryo; the other will develop into the other half of the embryo.
e) One cell will develop into a defective embryo and the other will die.

Answer: b

Difficulty: Hard
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

15) The original cell which arose billions of years ago is referred to by some evolutionary biologists as the _____.

a) first universal common ancestor
b) last universal common ancestor
c) evolutionary tree root
d) evolutionary shrub
e) first eukaryote

Answer: b

Difficulty: Medium
Learning Objective: LO 1.2 Explain the importance of the fundamental properties shared by all cells.
Section Reference: Section 1.2 Basic Properties of Cells

16) What characteristics distinguish prokaryotic and eukaryotic cells?

a) Eukaryotes have membrane-bound organelles; prokaryotes do not.
b) Prokaryotes have relatively little DNA; eukaryotes generally have much more.

c) Eukaryotic chromosomes are linear; prokaryotic chromosomes are circular.
d) Eukaryotic DNA is usually heavily associated with protein to form a nucleoprotein complex called chromatin, which is not seen in prokaryotic genetic material.
e) All of these are correct.

Answer: e

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

17) Which of the following are NOT considered to belong to the Archaea?

a) Methanogens
b) Halophiles
c) Acidophiles
d) Thermophiles
e) Eubacteria

Answer: e

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

18) Which of the following are considered to be eukaryotes?

a) amoebae
b) yeast
c) holly
d) starfish
e) all choices are eukaryotic

Answer: e

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

19) The genetic material of a prokaryotic cell is present in the _____, a poorly defined region of the cell that lacks a boundary membrane to separate it from the surrounding cytoplasm.

a) nucleus
b) chromatic region
c) nucleoid
d) pharmacopeia
e) genetome

Answer: c

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

20) Some bacteria can pass a piece of DNA from a donor bacterial cell to a recipient bacterial cell through a structure called a pilus. What is this process called?

a) confirmation
b) transduction
c) transformation
d) conjugation
e) fission

Answer: d

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

21) Cyanobacteria are capable of photosynthesis, but many of them also convert nitrogen gas into reduced forms of nitrogen (such as ammonia) that can be used by cells in the synthesis of nitrogen-containing organic compounds, including amino acids and nucleotides. This process is called _____.

a) nitrogen fixation
b) denitrification
c) nitrification

d) respiration
e) ammoniation

Answer: a

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

22) The process by which a relatively unspecialized cell becomes highly specialized is called _____.

a) differentiation
b) determination
c) degeneracy
d) denaturation
e) renaturation

Answer: a

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

23) Bacteria often live in complex, multi-species communities, like the layer of plaque that grows on your teeth; such a community is called _____.

a) a biotome
b) a microtome
c) a biofilm
d) an anatome

Answer: c

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

24) The rapidity and cost-efficiency of DNA sequencing has made it possible to sequence virtually all of the genes present in the microbes of a given habitat. This generates a collective genome for that habitat, which has come to be called _____.

a) a metachron
b) a metagenome
c) a netagenome
d) a megagene
e) an exogenome

Answer: b

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

25) The collection of bacteria that live on and within the human body are being isolated, identified and characterized; they are referred to as the human _____. It has been demonstrated that these organisms differ based upon the age, diet, geography and state of health of the human from which they were obtained.

a) macrobiome
b) metagenome
c) minibiome
d) microbiome
e) homobiome

Answer: d

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

26) Studies on mice suggest that bacterial species predominating in obese individuals differ from those in the digestive tracts of lean individuals and that they play a role in weight gain in obese individuals. What are these bacteria in obese individuals proposed to do that increases weight gain in obese individuals?

a) They make obese mice eat more food.

b) They release chemicals that increase the caloric intake by the mice.
c) The bacteria in obese individuals may release more calories from digested food than their counterparts in leaner individuals.
d) The bacteria in obese individuals turn the food in the intestines to fat.
e) The bacteria in obese individuals produce gas that makes their hosts obese.

Answer: c

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

27) Which of the following is NOT a model organism used for understanding basic processes of life?

a) *Mus musculus*
b) *Drosophila melanogaster*
c) *Homo sapiens*
d) *Arabidopsis thaliana*
e) *Caenorhabditis elegans*

Answer: c

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

28) The field of biological research in which biologists are attempting to create a living cell in the laboratory, essentially from scratch is known as _____. More modestly, this branch of biology also has a goal of developing novel life forms, beginning with existing organisms, that have a unique value in medicine, industry or in cleaning up the environment.

a) megalomaniacal biology
b) synthetic biology
c) production-grade biology
d) industrial biology
e) pharmaceutical biology

Answer: b

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

29) What is the most appropriate unit of measurement for macromolecular complexes including ribosomes and microfilaments?

a) picometers
b) angstroms
c) nanometers
d) micrometers
e) centimeters

Answer: c

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

30) What is the most appropriate unit of measurement for most types of cells?

a) picometers
b) angstroms
c) nanometers
d) micrometers
e) centimeters

Answer: d

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

31) Which statement is NOT correct regarding Archaea?

a) They are considered more closely related to bacteria than to eukarya.

b) Some are able to generate methane from carbon dioxide and hydrogen gases.
c) Some are halophiles capable of surviving in a 5M osmolality.
d) Some can survive temperatures above 120°C.

Answer: a

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

32) The flagellum of *E. coli* is chemically most similar to the flagellum of _____.

a) a human sperm cell
b) a protist
c) green algae like *Euglena*
d) the bacterium *Salmonella*
e) all are made of the same molecules

Answer: d

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

33) Which of the following is NOT a feature shared by all cells?

a) plasma membrane with similar chemical construction
b) genetic information encoded in DNA nucleotides
c) shared metabolic pathways
d) division of cells into nucleus and cytoplasm
e) similar energy storing chemicals such as ATP

Answer: d

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

34) Which feature is unique to some eukaryotic cells and never seen in prokaryotic cells?

a) plasma membrane with similar chemical construction
b) phagocytic ability
c) shared metabolic pathways
d) genetic information encoded in DNA nucleotides
e) cytoskeletal filaments built of proteins such as actin and tubulin

Answer: b

Difficulty: Hard
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

35) Which feature is shared by both prokaryotic and eukaryotic cells?

a) complex chromosomes capable of forming condensed chromatin
b) complex cilia and flagella
c) photosystems housed in chloroplast membranes
d) cell division employing a mitotic spindle
e) diploid chromosomes inherited from several parents

Answer: b

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

36) Which organelle is found in both eukaryotes and prokaryotes?

a) nucleus
b) mitochondria
c) endoplasmic reticulum
d) proteasome
e) Golgi apparatus

Answer: d

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

37) Which statement is NOT correct when describing eukaryotic and bacterial flagella?

a) they generate movement by different mechanisms
b) the bacterial flagellum is more complex
c) the eukaryotic flagellum is not found on all cells
d) the bacterial flagellum can rotate at speeds greater than 1,000 rotations per second
e) all flagella allow cells possessing them to exhibit motility

Answer: b

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

38) The term used to describe the life forms capable of withstanding a variety of harsh environments is:

a) methanogen
b) halophile
c) extremophile
d) thermophile
e) normophile

Answer: c

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

39) Which of these cell types does NOT possess membrane-bound organelles?

a) human cells
b) *Volvox* cells

c) *E. coli*
d) yeast cells
e) plant cells

Answer: c

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

40) Which of the following statements about viruses is NOT true?

a) All viruses are obligatory intracellular parasites.
b) All viruses are obligatory intercellular parasites.
c) Viruses occur in a wide variety of very different shapes, sizes and constructions.
d) A viral host may be a plant, animal or bacterial cell.
e) Viral genetic material can be either RNA or DNA.

Answer: b

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

41) Outside of a living cell, the virus exists as a particle called _____, which is little more than a macromolecular package.

a) a virulent
b) a virusette
c) a virulant
d) a virion
e) an infectoid

Answer: d

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

42) Viruses like adenovirus, which causes respiratory infections in mammals, have a 20-sided polyhedral capsid. What is this polyhedral shape called?

a) a tetrahedron
b) a dodechedron
c) a polygon
d) an icosahedron
e) an octahedron

Answer: d

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

43) Usually, a virus infects a cell and arrests the normal synthetic activities of the host, redirecting the cell to use its available materials to manufacture viral nucleic acids and proteins, which assemble into new viruses. Ultimately, the infected cell ruptures and releases a new generation of viral particles that can infect neighboring cells. This type of infection is called _____ infection.

a) a lytic
b) a proviral
c) an eluctable
d) a virulent
e) an avirulent

Answer: a

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

44) In some cases, an infecting virus does not lead to the death of the host cell, but instead integrates its DNA into the DNA of the host cell's chromosomes. Integration of the viral DNA can have different effects; for example, the infected cell might exhibit normal behavior until exposure to a stimulus that activates the dormant viral DNA, triggering production of viral progeny that bud off of the infected cell or a loss of control over growth and division leading to malignancy. Such an infection is referred to as _____ infection.

a) a lytic
b) a proviral

c) an eluctable
d) a virulent
e) an avirulent

Answer: b

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

45) From what is the lipid-containing outer envelope surrounding the viral capsid of many animal viruses usually derived?

a) the nuclear envelope
b) the outer mitochondrial membrane
c) the plasma membrane
d) the lysosomal membrane
e) the outer membrane of the chloroplast

Answer: c

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

46) Which of the following is NOT typically a behavior exhibited by a cell with a proviral infection?

a) Immediate production of new viruses and subsequent lysis of the host cell.
b) Normal behavior until exposure to a stimulus, like UV radiation, that activates dormant viral DNA, leading to lysis of the host cell and release of viral progeny.
c) Production of new viral progeny that bud at the cell surface without lysing the infected cell.
d) Loss of control in animal cells over their growth and division followed by malignancy.

Answer: a

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

47) What advantageous uses have viruses been shown to have?

a) The activities of viral genes mimic those of host genes so they are useful for studying mechanisms of DNA replication and gene expression in their much more complex hosts.
b) They can be used as a means to introduce foreign genes into human cells, which may serve as a basis for treatment of human diseases by gene therapy.
c) Insect-killing viruses may play an increasing role in the war against insect pests.
d) Bacteria-killing viruses may play an increasing role in the war against bacterial pathogens.
e) All of these are correct.

Answer: e

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

48) Potato spindle-tuber disease, which causes potatoes to become gnarled and cracked, is caused by an infectious agent consisting of a small circular RNA molecule that totally lacks a protein coat. These infectious agents are thought to exert their effects by interfering with the cell's normal path of gene expression. Such an infectious agent is known as _____.

a) a provirous
b) a bacteriophage
c) a viroid
d) a virunette
e) an eviscerion

Answer: c

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

49) What major feature distinguishes the theoretical first eukaryotic common ancestor (FECA) from prokaryotes?

a) DNA
b) closed internal compartments
c) plasma membrane
d) ribosomes
e) heterotrophy

Answer: b

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

50) Prokaryotic cells have been identified in rock dated at _____

a) 2.7 million years old
b) 2.7 billion years old
c) 2.4 million years old
d) 2.4 billion years old
e) 4 billion years old

Answer: b

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

51) Evidence of prokaryotes in the fossil record precedes eukaryotic cells by:

a) around 1 billion years
b) 4 billion years
c) 10 billion years
d) both appear at the same time in the fossil record

Answer: a

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

52) Lynn Margulis's resurrected hypothesis that eukaryotic evolution was partly a result of the internal residence of prokaryotic organisms is termed the _____ theory.

a) phagocytosis
b) ingestion

c) endosymbiont
d) invasive
e) digestion

Answer: c

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

53) The term _____ describes the ability of a life form to synthesize its organic molecules from other organic nutrients.

a) autotroph
b) heterotroph
c) phototroph
d) chemotroph
e) lithotroph

Answer: b

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

54) Which of these terms describes an organism which metabolizes by using oxygen and builds cellular materials from other organic compounds?

a) anaerobic heterotroph
b) aerobic heterotroph
c) anaerobic autotroph
d) aerobic autotroph

Answer: b

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

55) The ancestral cell which had characteristics including mitochondria, evolutionarily derived functions such as intron splicing, ability to undergo meiosis, and cytoskeletal elements has been termed the _____.

a) LUCA (last universal common ancestor)
b) FECA (first eukaryotic common ancestor)
c) LECA (last eukaryotic common ancestor)
d) FUCA (first universal common ancestor)

Answer: c

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

56) Which organelle is believed to have been acquired by eukaryotic cells most recently?

a) mitochondria
b) Golgi apparatus
c) chloroplasts
d) lysosomes
e) endoplasmic reticulum

Answer: c

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

57) What is thought to explain why Preaxostyla is a eukaryote without mitochondria?

a) this lineage of eukaryotic cells never inherited mitochondria
b) the mitochondria mutated into another organelle
c) the mitochondria are digested by lysosomes
d) the mitochondria were lost

Answer: d

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

58) Who proposed that life forms should be categorized into three distinct evolutionary lines rather than the traditionally accepted two lines of prokaryotes and eukaryotes?

a) Lynn Margulis
b) Carl Woese
c) Charles Darwin
d) Gregor Mendel
e) Watson and Crick

Answer: b

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

59) Which term is now used to describe the three distinct evolutionary lines proposed by Carl Woese and his colleagues?

a) Kingdoms
b) Domains
c) Phyla
d) Clades
e) Species

Answer: b

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

60) Supergroups of eukaryotic organisms are mostly separate groups of:

a) animals
b) plants
c) protists
d) viruses
e) algae

Answer: c

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

61) The major lineages derived from LECA (last eukaryotic common ancestor) are termed _____.

a) kingdoms
b) domains
c) phyla
d) supergroups
e) species

Answer: d

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

62) The supergroup containing animals is _____.

a) Opisthokonta
b) Amoebozoa
c) Excavata
d) Archaeplastida
e) SAR

Answer: a

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

63) The supergroup containing fungi is _____.

a) Opisthokonta
b) Amoebozoa
c) Excavata
d) Archaeplastida
e) SAR

Answer: a

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

64) The supergroup containing plants is _____.

a) Opisthokonta
b) Amoebozoa
c) Excavata
d) Archaeplastida
e) SAR

Answer: d

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

65) The supergroup containing protozoan parasites such as *Giardia* is _____.

a) Opisthokonta
b) Amoebozoa
c) Excavata
d) Archaeplastida
e) SAR

Answer: c

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

66) The supergroup containing ciliated protozoa is _____.

a) Opisthokonta
b) Amoebozoa
c) CCTH

d) Archaeplastida
e) SAR

Answer: e

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

67) The supergroup containing the most obscure and poorly understood protozoa is _____.

a) Opisthokonta
b) Amoebozoa
c) Excavata
d) CCTH
e) SAR

Answer: d

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

68) Which of these pairs of life forms are considered to be most closely related?

a) animals and plants
b) plants and fungi
c) animals and fungi
d) *Giardia* and ciliated protozoa
e) amoebae and ciliated protozoa

Answer: c

Difficulty: Hard
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

69) Which of these pairs of life forms are considered to be most closely related?

a) green algae and brown algae
b) plants and fungi
c) plants and green algae
d) *Giardia* and ciliated protozoa
e) amoebae and ciliated protozoa

Answer: c

Difficulty: Hard
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

70) Given that cells possess genes from a variety of different ancestral sources, deciding which to use for evolutionary relatedness comparisons can be complicated. The best candidates for determining phylogenetic relationships tend to be _____.

a) informational genes because they operate singly and uniquely
b) metabolic activity-related genes because they operate singly and uniquely
c) informational genes because they encode components which are parts of large complexes and conservation of structure is required
d) metabolic activity-related genes because they encode enzymes which are parts of large complexes and conservation of structure is required
e) all gene types provide the same phylogenetic accuracy

Answer: c

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

71) Yeast genome analysis has revealed a mixed ancestry of eubacterial and archaebacterial gene inheritance. Studies presently show:

a) archaeal character in metabolic genes and eubacterial character in the informational genes
b) eubacterial character in metabolic genes and archaeal character in the informational genes
c) eubacterial character in informational and metabolic genes and archaeal character in cell wall genes
d) archaeal character in informational and metabolic genes and eubacterial character in cell wall genes
e) eubacterial character in informational and metabolic genes and archaeal character in motility genes

Answer: b

Difficulty: Hard
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

72) The best explanation of what defines a multicellular organism, as opposed to a colonial one, is that:

a) a multicellular organism can exist and propagate as both a single-celled or a multicelled form.
b) a multicellular organism can only exist and propagate as a multicelled form.
c) a multicellular organism can only exist and propagate as a single-celled form.
d) a multicellular organism shows signs of cellular differentiation throughout its life cycle.

Answer: b

Difficulty: Medium
Learning Objective: LO 1.5 Differentiate a colony of individual single-celled organisms from a multicellular organism.
Section Reference: Section 1.5 Green Cells: *Volvox*, an Experiment in Multicellularity

73) Volvox is characterized by possessing _____ cells.

a) 4
b) around 100
c) 1,000 or more
d) millions of

Answer: c

Difficulty: Easy
Learning Objective: LO 1.5 Differentiate a colony of individual single-celled organisms from a multicellular organism.
Section Reference: Section 1.5 Green Cells: *Volvox*, an Experiment in Multicellularity

74) *Volvox* is a member of the supergroup _____.

a) Opisthokonta
b) Amoebozoa
c) CCTH
d) Archaeplastida
e) SAR

Answer: d

Difficulty: Easy
Learning Objective: LO 1.5 Differentiate a colony of individual single-celled organisms from a multicellular organism.
Section Reference: Section 1.5 Green Cells: *Volvox*, an Experiment in Multicellularity

75) It is believed that _____ and _____ evolved from _____.

a) plants, *Volvox*, a common ancestor
b) land plants, aquatic plants, *Volvox*
c) land plants, *Volvox*, aquatic plants
d) Volvox, aquatic plants, land plants

Answer: a

Difficulty: Medium
Learning Objective: LO 1.5 Differentiate a colony of individual single-celled organisms from a multicellular organism.
Section Reference: Section 1.5 Green Cells: *Volvox*, an Experiment in Multicellularity

76) *Volvox* possesses enlarged cells called _____ which have a reproductive function.

a) gametes
b) ova
c) gonidia
d) spermatogonia
e) oogonia

Answer: c

Difficulty: Easy
Learning Objective: LO 1.5 Differentiate a colony of individual single-celled organisms from a multicellular organism.
Section Reference: Section 1.5 Green Cells: *Volvox*, an Experiment in Multicellularity

77) What characteristic of collagen makes it a suitable material for inclusion in tissue engineering experiments?

a) elasticity
b) degradability
c) adhesiveness
d) immunogenicity
e) good electrical conductivity

Answer: b

Difficulty: Easy
Learning Objective: LO 1.6 Describe how tissue engineering can create cell-based replacement organs.
Section Reference: Section 1.6 Engineering Linkage: Tissue Engineering

78) Which of these is a man-made biodegradable polymer?

a) collagen
b) poly-lactic acid
c) lactate
d) silk fiber
e) all choices are correct

Answer: b

Difficulty: Easy
Learning Objective: LO 1.6 Describe how tissue engineering can create cell-based replacement organs.
Section Reference: Section 1.6 Engineering Linkage: Tissue Engineering

Question Type: Multiple Select

79) Which of the following is a tenet of the Cell Theory? (Select all correct choices)

a) All organisms are composed of one or more cells.
b) The cell is the structural unit of life.
c) Cells can arise only by division from a preexisting cell.
d) Cells divide only by fission.

Answer: a, b, c

Difficulty: Medium
Learning Objective: LO 1.1 List the three tenets of the Cell Theory..
Section Reference: Section 1.1 The Discovery of Cells

80) What factor or factors discovered with electron microscopy distinguished prokaryotic from eukaryotic cells? (Select all correct choices)

a) their size
b) their color
c) the types of their internal structures or organelles
d) their fragility

Answer: a, c

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

Question type: Multiple Choice

81) Archaea are found in environments with which characteristics?

a) extreme salinity
b) low pH
c) extreme heat
d) normal temperature ranges
e) All of the choices are correct.

Answer: e

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

Question type: Multiple Select

82) You find a single-celled organism which you believe is a new eukaryotic life form. Which features might it possess if it is average in most of its characteristics? (Select all correct choices)

a) genome encoding around 1,000 proteins
b) genome encoding more than 6,000 proteins
c) 4 million base pairs of DNA
d) 8 million base pairs of DNA
e) 16 million base pairs of DNA

Answer: b, e

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

83) According to the text, in which environments have bacteria been isolated? (Select all correct choices)

a) Antarctic ice shelves
b) dry deserts
c) mile-deep rock layers
d) molten magma
e) human intestines

Answer: a, b, c, e

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

84) Why are viruses NOT considered to be organisms and not described as being alive? (Select all correct choices)

a) Viruses are unable to reproduce by themselves.
b) Viruses are not able to metabolize by themselves.
c) Viruses are not able to synthesize DNA by themselves.
d) Viruses are not able to assemble spontaneously.

Answer: a, b, c

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

85) Among the most complex viruses are the _____, which are also the most abundant biological entities on Earth. (Select all correct descriptive terms)

a) mammalian viruses
b) bacterial viruses
c) vibriovirions
d) bacteriophages

Answer: b, d

Difficulty: Easy
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

86) Acquisition of cyanobacterium-like cells by an early heterotrophic anaerobe changed the cell's ability to _____. (Select all correct choices)

a) acquire its organic building blocks
b) live in an oxygen containing environment
c) create ATP in mitochondria
d) synthesize DNA in a nucleus
e) traffic molecules through membranous organelles like the Golgi apparatus

Answer: a, b

Difficulty: Hard
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

87) Which abilities/characteristics are thought to have been possessed by LECA (last eukaryotic common ancestor) but NOT by FECA (first eukaryotic common ancestor)? (Select all correct choices)

a) ability to synthesize internal membranes

b) phagocytic ability
c) ability to splice introns
d) development of meiosis
e) possession of mitochondria

Answer: c, d, e

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

88) Which abilities/characteristics are thought to have been possessed by both LECA (last eukaryotic common ancestor) and by FECA (first eukaryotic common ancestor)? (Select all correct choices)

a) ability to synthesize internal membranes
b) phagocytic ability
c) ability to splice introns
d) development of meiosis
e) possession of mitochondria

Answer: a, b

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

89) Gene transfer from one organism to another within the same generation of cells is termed _____. (Select all correct choices)

a) parental gene transfer
b) horizontal gene transfer
c) vertical gene transfer
d) lateral gene transfer
e) endosymbiont gene transfer

Answer: b, d

Difficulty: Medium
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

90) Examples of the types of informational gene which provide accurate phylogenetic relationship determinations include: (Select all correct choices)

a) ribosomal RNA genes
b) genes encoding cell membrane signal proteins
c) DNA polymerase genes
d) transfer RNA genes
e) genes encoding metabolic activities

Answer: a, c, d

Difficulty: Hard
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

91) Which of these are viable suggestions to explain the mixed character of the eukaryotic genome? (Select all correct choices)

a) an archaebacterial cell fused with a eubacterial cell and the genomes integrated
b) eubacterial genes migrated from chloroplasts and mitochondria to become nuclear genes
c) eukaryotic genes migrated from chloroplasts and mitochondria to become nuclear genes
d) eukaryotic cells evolved from archaebacterial ancestors and then picked up eubacterial genes
e) archaebacterial genes migrated from chloroplasts and mitochondria to become nuclear genes

Answer: a, b, d

Difficulty: Hard
Learning Objective: LO 1.4 Distinguish the structures and functions of viruses and viroids.
Section Reference: Section 1.4 Viruses and Viroids

92) A typical example of a colonial organism is: (Select all correct choices)

a) plasmodial slime mold
b) *Volvox*
c) *Dictyostelium*
d) *Gonium*
e) *Pleodornium*

Answer: a, c

Difficulty: Easy
Learning Objective: LO 1.5 Differentiate a colony of individual single-celled organisms from a multicellular organism.
Section Reference: Section 1.5 Green Cells: *Volvox*, an Experiment in Multicellularity

93) What materials are found in fully artificial organs? (Select all correct choices)

a) plastics
b) ceramics
c) electronics
d) heavy metals
e) recombinant cells

Answer: a, c

Difficulty: Easy
Learning Objective: LO 1.6 Describe how tissue engineering can create cell-based replacement organs.
Section Reference: Section 1.6 Engineering Linkage: Tissue Engineering

94) What materials are being researched in constructing cell-based replacement organs? (Select all correct choices)

a) plastic 3-D scaffolds
b) tissue cells from the patient requiring the organ replacement
c) collagen fibrils
d) electronics
e) blood cells from the patient requiring the organ replacement

Answer: a, b, c, e

Difficulty: Easy
Learning Objective: LO 1.6 Describe how tissue engineering can create cell-based replacement organs.
Section Reference: Section 1.6 Engineering Linkage: Tissue Engineering

95) Scaffolds for tissue engineering need to be porous because: (Select all correct choices)

a) this creates more surface area for cell adhesion
b) this will allow access for electronic circuitry to be connected to cells in the replacement organ

c) nutrient and waste diffusion will be more effective
d) the scaffold will be more rigid and strong
e) the scaffold will be more likely to be accepted by the immune defenses of the body

Answer: a, c

Difficulty: Medium
Learning Objective: LO 1.6 Describe how tissue engineering can create cell-based replacement organs.
Section Reference: Section 1.6 Engineering Linkage: Tissue Engineering

96) How have scientists attempted to create a porous scaffold for tissue engineering? (Select all correct choices)

a) through a process known as electrospinning
b) by using spider web silk
c) by use of ultraviolet light-induced degradation of plastics
d) by electron bombardment of plastics
e) by forcing gases through a liquid matrix material

Answer: a, e

Difficulty: Easy
Learning Objective: LO 1.6 Describe how tissue engineering can create cell-based replacement organs.
Section Reference: Section 1.6 Engineering Linkage: Tissue Engineering

97) Viable adult stem cells have been located in _____ tissue. (Select all correct choices)

a) muscle
b) nervous
c) bone marrow
d) fat
e) dead

Answer: a, b, c, d

Difficulty: Easy
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.

Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

98) Types of stem cells include: (Select all correct choices)

a) adult stem cells
b) undifferentiated embryonic stem cells
c) induced pluripotent stem cells
d) undifferentiated pluripotent stem cells
e) induced adult stem cells

Answer: a, b, c

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

99) Likely potential benefits from research using induced pluripotent stem cells include: (Select all correct choices)

a) advances in individualized cell replacement therapies
b) creating cells with disease specific phenotypes to better understand some clinical conditions
c) creating designer drugs for treating disease
d) advances in gene therapy
e) advances in bacteriophage therapy

Answer: a, b

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells

100) Risks associated with embryonic stem cell therapies include: (Select all correct choices)

a) development of cancer
b) immunological rejection of transplants created for unrelated organ recipients
c) development of teratomas
d) complications with the use of non-human biological materials
e) competition with the technology used in employing induced pluripotent stem cell technology

Answer: b, c, d

Difficulty: Medium
Learning Objective: LO 1.3 Compare the structures and functions of prokaryotic and eukaryotic cells.
Section Reference: Section 1.3 Two Fundamentally Different Classes of Cells