Test Bank for Microbiology 3rd Edition by Wessner

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Test Bank

Package Title: Test Bank
Course Title: Wessner 3e
Chapter Number: 1 The Microbial World

Question Type: Multiple Choice

1) Which of these is considered to be the smallest unit of life?

a) A nucleus
b) A mitochondrion
c) A plasmid
d) A cell
e) A prion

Answer: d

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

2) The study of microbiology includes all of the following EXCEPT _____.

a) plants
b) viruses
c) bacteria
d) fungi
e) algae

Answer: a

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

3) What percent of the dry weight of the cell is composed of DNA?

a) 2–5
b) 12–15
c) 25–30
d) 35–40

e) 50–55

Answer: a

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

4) What are the three domains of life?

a) Monera, Animals, and Plants
b) Bacteria, Archaea, and Eukarya
c) Prokaryote, Eukaryote, and Fungi
d) Animals, Plants, and Bacteria
e) Prokaryote, Eukaryote, and Archaea

Answer: b

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

5) Which of the characteristics of life is NOT displayed by any individual organism?

a) Metabolism
b) Growth
c) Reproduction
d) Evolution
e) Response
f) Homeostasis

Answer: d
Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

6) Viruses are considered "nonliving" for all of the following reasons EXCEPT that they

a) need a host cell for replication.
b) are metabolically inert.

c) possess a genome that can change over time.
d) do not maintain internal homeostasis.
e) are not responsive to environmental changes.

Answer: c

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

7) Which is a macromolecular difference between the domains Bacteria and Archaea?

a) Archaea contain a nucleus, but Bacteria do not.
b) Bacteria contain DNA, but Archaea do not.
c) Bacteria contain a plasma membrane, but Archaea do not.
d) Bacteria cell wall contains peptidoglycan, but the Archaea cell wall does not.
e) Archaea contain multiple types of RNA polymerase, but Bacteria has only one type.

Answer: d

Difficulty: Hard
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

8) The size and shapes of archaeal cells suggest relatedness to

a) bacteria.
b) prokaryotes.
c) eukarya.
d) all other life forms.
e) no other life forms; their sizes and shapes are unique.

Answer: a

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

9) Why is the term *microbes* more general than the term *microorganisms*?

a) There is no difference between these two terms.
b) The term *microbes* is just a more casual way of saying microorganisms.
c) It includes viruses.
d) It includes fungus.
e) It includes archaea.

Answer: c

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

10) Which molecular tool MOST assisted in providing a more reliable way to verify the assertions made by Woese et al. in their 1990 paper on phylogeny?

a) Polymerase chain reaction
b) RNA to DNA conversion using reverse transcriptase
c) RNA sequencing
d) DNA sequencing
e) Protein sequencing

Answer: a

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

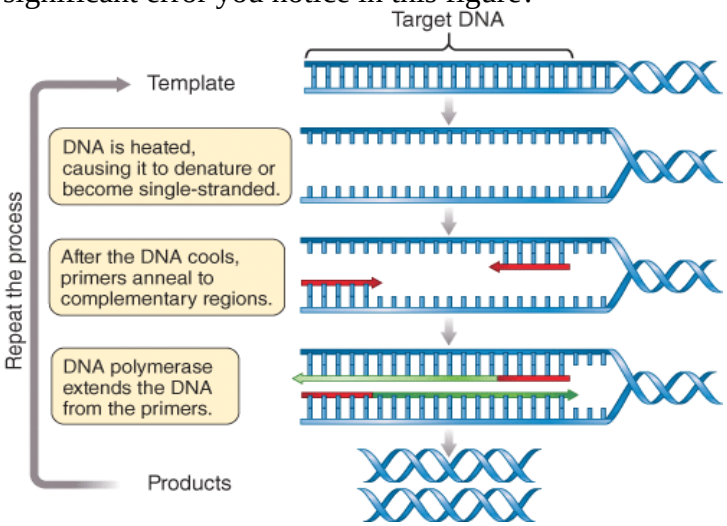
11) If *E. coli* DNA polymerase, not Taq polymerase, were used in polymerase chain reaction assays to amplify SSU rRNA gene sequences, we would expect to see

a) increased short fragment DNA sequences.
b) decreased short fragment DNA sequences.
c) the same number of short fragment DNA sequences.
d) increased long fragment DNA sequences.
e) decreased long fragment DNA sequences.

Answer: b

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

12) This figure represents an artist's attempt to illustrate the process of PCR. What is the MOST significant error you notice in this figure?



a) DNA strands are not fully denatured.
b) Primers are not annealed.
c) PCR products cannot separate from template DNA.
d) Taq polymerase is not shown in the illustration.
e) dNTPs are not shown in the illustration.

Answer: a

Difficulty: Hard
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

13) Select the answer with the correct order in which these structures evolved in plant cells.

a) Mitochondria, cell walls, chloroplasts
b) Mitochondria, chloroplasts, cell walls
c) Chloroplasts, mitochondria, cell walls
d) Chloroplasts, cell walls, mitochondria
e) Cell walls, mitochondria, chloroplasts

Answer: b

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

14) Approximately when did primitive cells first appear on Earth?

a) 1 billion years ago
b) 2 billion years ago
c) 2.5 billion years ago
d) 3 billion years ago
e) 3.8 billion years ago

Answer: e

Difficulty: Easy
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

15) Which of these are fossilized microbial mats containing photosynthetic bacteria?

a) Stromatolites
b) Biofilms
c) Resin
d) Cyanobacteria
e) Stalagmites

Answer: a

Difficulty: Easy
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

16) Which statement below is FALSE concerning the atmosphere of early Earth?

a) The atmosphere was a reducing atmosphere.
b) Oxygen was present in very minute amounts.
c) Carbon dioxide was present in very minute amounts.
d) Hydrogen gas was present.
e) Nitrogen gas was present in very large amounts.

Answer: c

Difficulty: Easy
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation

Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

17) The discovery of ribozymes provides evidence that life on early Earth may have been based on

a) DNA.
b) proteins.
c) RNA.
d) lipids.
e) polysaccharides.

Answer: c

Difficulty: Easy
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

18) The Endosymbiotic Theory is used to explain which of the following?

a) Rapid evolution of viruses
b) Antiphagocytic abilities of parasitic protozoa
c) Emergence of cell walls
d) Presence of mitochondria in eukarya
e) Development of the nucleus in eukarya

Answer: d

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

19) From which branch of the phylogenetic tree of life does the domain Eukarya originate?

a) Bacteria
b) Archaea
c) It is equal distance from both Bacteria and Archaea.
d) Eukarya is the originator of life, and Bacteria and Archaea branched off of that.
e) Eukarya, Bacteria, and Archaea are distinct groups and do not share any branches.

Answer: b

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

20) A restriction endonuclease cuts DNA at the sequence ACGT. If we assume that all four bases are equally represented in DNA, then how frequently will this sequence occur on a DNA strand?

a) Roughly every 100 base pairs
b) Roughly every 250 base pairs
c) Roughly every 1000 base pairs
d) Roughly every 10,000 base pairs
e) Roughly every 20,000 base pairs

Answer b

Difficulty: Hard
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

21) What disease was the first antimicrobial drug, Salvarsan, designed to treat?

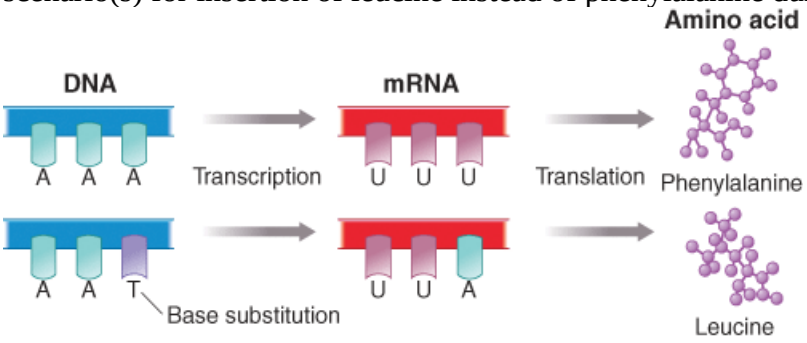
a) Syphilis
b) Plague
c) Anthrax
d) Smallpox
e) Malaria

Answer: a

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

22) This figure relates to the flow of information from DNA to RNA to protein and shows how a mutation in the DNA an alter the amino acid present in a protein. Select an alternative

scenario(s) for insertion of leucine instead of phenylalanine during translation.



a) Error-prone RNA polymerase creates a mutant mRNA from a correct DNA template.
b) Mutated tRNA introduces leucine instead of phenylalanine against the correct mRNA sequence.
c) Mutated ribosome creates an environment where mRNA-tRNA mismatches occur infrequently.
d) Both a and b are possible correct scenarios.

Answer: d

Difficulty: Hard
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

23) Eukaryal life forms without mitochondria do exist. Which of the following are they likely to be?

a) Animals
b) Terrestrial plants
c) Oceanic giant kelps
d) Single-celled protists

Answer: d

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

24) When would you speculate that the extinction of most eukaryal life forms without mitochondria would have begun?

a) 3.5 billion ybp
b) 3 billion ybp
c) 2 billion ybp
d) 1 billion ybp
e) 500 million ybp

Answer: c

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

25) Which of these best describes horizontal gene transfer?

a) Mitosis followed by cytokinesis
b) Meiosis and subsequent formation of a zygote
c) Transfer of genes from mother cell to daughter cell
d) DNA replication followed by crossing over
e) Acquisition of genes from another organism in the same generation

Answer: e

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

26) Which of these gene expression errors will result in heritable genetic change?

a) DNA polymerase error introduces an incorrect base.
b) RNA polymerase error creates a mutated mRNA.
c) RNA polymerase error creates a mutated tRNA.
d) RNA polymerase error creates a mutated rRNA.

Answer: a

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

27) Which is the correct distinction between a heterotroph and an autotroph?

a) An autotroph utilizes organic compounds as a carbon source, and a heterotroph uses carbon dioxide as a carbon source.
b) An autotroph utilizes carbon dioxide as a carbon source, and a heterotroph utilizes organic compounds as a carbon source.
c) An autotroph utilizes complex organic compounds as a carbon source, and a heterotroph utilizes simple organic compounds as a carbon source.
d) An autotroph utilizes carbon dioxide as an energy source, and a heterotroph utilizes organic compounds as an energy source.
e) An autotroph utilizes organic compounds as an energy source, and a heterotroph utilizes carbon dioxide as an energy source.

Answer: b

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

28) Which best describes a photoautotroph?

a) Utilizes sunlight for energy and organic molecules as a carbon source
b) Utilizes sunlight as an energy source to fix carbon dioxide
c) Emits light from the breakdown of organic carbon
d) Emits light from the fixation of carbon dioxide
e) Uses organic compounds as a source of carbon and energy

Answer: b

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

29) Which best describes the Cyanobacteria?

a) First prokaryote to contain mitochondria
b) First bacteria to appear on Earth about 3.5 billion years ago
c) Bacteria that carry out oxygenic photosynthesis
d) Members of the Archaea domain
e) A type of eukaryal algae

Answer: c

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

30) PCR allows researchers to

a) reliably identify the sequence of DNA fragments.
b) dramatically increase the ability of computers to compare genomic sequences.
c) cleave specific sequences of DNA.
d) quickly amplify specific DNA pieces.
e) easily insert foreign DNA into new host cells.

Answer: d

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

31) What term applies to the oxidation of glucose to pyruvate for the generation of energy?

a) Gluconeogenesis
b) Krebs cycle
c) Lactate fermentation
d) Pentose phosphate pathway
e) Glycolysis

Answer: e

Difficulty: Easy
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

32) Which of these is required during aerobic respiration?

a) Oxygen
b) Glucose
c) Nitrate
d) Pyruvate

e) Water

Answer: a

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

33) During nitrogen fixation, microorganisms convert

a) nitrate to dinitrogen gas.
b) dinitrogen gas to ammonia.
c) ammonia to dinitrogen gas.
d) dinitrogen gas to nitrate.
e) ammonia to nitrate.

Answer: b

Difficulty: Medium
Section Reference: Section 1.3 Microbial Ecology and Biotechnology
Learning Objective: LO 1.3 Discuss the various forms of microbial metabolism and the possible ways which microbes may interact with the environment, each other and other organisms.

34) During ammonification, microorganisms convert

a) ammonia to nitrates.
b) amino acids to ammonia.
c) ammonia to dinitrogen gas.
d) dinitrogen gas to ammonia.

Answer: b

Difficulty: Hard
Section Reference: Section 1.3 Microbial Ecology and Biotechnology
Learning Objective: LO 1.3 Discuss the various forms of microbial metabolism and the possible ways which microbes may interact with the environment, each other and other organisms.

35) This early microbiology pioneer developed a set of criteria for linking a specific microorganism to a specific disease.

a) Louis Pasteur

b) Edward Jenner
c) Robert Koch
d) John Tyndall
e) Anton van Leeuwenhoek

Answer: c

Difficulty: Easy
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

36) This early microbiologist used a swan-necked flask to help disprove the Theory of Spontaneous Generation.

a) Louis Pasteur
b) Edward Jenner
c) Robert Koch
d) John Tyndall
e) Anton van Leeuwenhoek

Answer: a

Difficulty: Easy
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

37) Who was the first person to provide a written description of bacteria?

a) Louis Pasteur
b) Edward Jenner
c) Robert Koch
d) John Tyndall
e) Anton van Leeuwenhoek

Answer: e

Difficulty: Easy
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

38) Louis Pasteur's classic experiment using a swan-necked flask might not have disproved spontaneous generation if this microbial type had been present.

a) Aerobic microbes
b) Anaerobic microbes
c) Endospore forming microbes
d) Viruses

Answer: c

Difficulty: Hard
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

39) Prior to World War II, the greatest cause of death during wartime was

a) trauma on the battlefield.
b) starvation.
c) dysentery.
d) wound infection.
e) microbial disease.

Answer: e

Difficulty: Medium
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

40) The development of a vaccine against which disease would most dramatically reduce death rates in sub-Saharan Africa?

a) Tuberculosis
b) HIV
c) Malaria
d) Cholera
e) Smallpox

Answer: c
Difficulty: Medium
Section Reference: Section 1.4 Microbes and Disease

Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

41) One limitation to the knowledge gained through "non-cultivation-based" genomic research is that

a) phylogenetic comparisons cannot be made.
b) culture conditions for microbes are not established.
c) information is insufficient to establish microbial identity.
d) genome size cannot be determined.

Answer: b

Difficulty: Hard
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

Question Type: Multiple Select

42) You have found a novel free-living microbe that does not contain any DNA. Although this organism has a large concentration of RNA, it has a relatively smaller number of proteins compared to the average bacterium. This microbe could offer support for which of the following?

a) Three-domain classification system
b) Endosymbiotic theory
c) Pasteurization
d) Spontaneous generation
e) RNA world hypothesis

Answer: e

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

43) Which of the characteristics of life would NOT be displayed by an individual single-celled organism?

a) Metabolism
b) Growth

c) Reproduction
d) Evolution
e) Response
f) Homeostasis

Answer: d

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

44) Endospores are structures possessing which of the characteristics of life?

a) Metabolism
b) Growth
c) Reproduction
d) Evolution
e) Response
f) Homeostasis

Answer: e

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

45) When *Dictyostelium discoideum* transitions from single cells to a multicellular form, which life characteristics are evident in the multicellular form? (Select all that apply.)

a) Metabolism
b) Growth
c) Reproduction
d) Evolution
e) Response
f) Homeostasis

Answer 1: a
Answer 2: b
Answer 3: c
Answer 4: e
Answer 5: f

Difficulty: Hard
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

46) When *Dictyostelium discoideum* transitions from single cells to a multicellular form, which life characteristics are exhibited during the process? (Select all that apply.)

a) Metabolism
b) Growth
c) Reproduction
d) Evolution
e) Response
f) Homeostasis

Answer 1: a
Answer 2: b
Answer 3: c
Answer 4: e

Difficulty: Hard
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

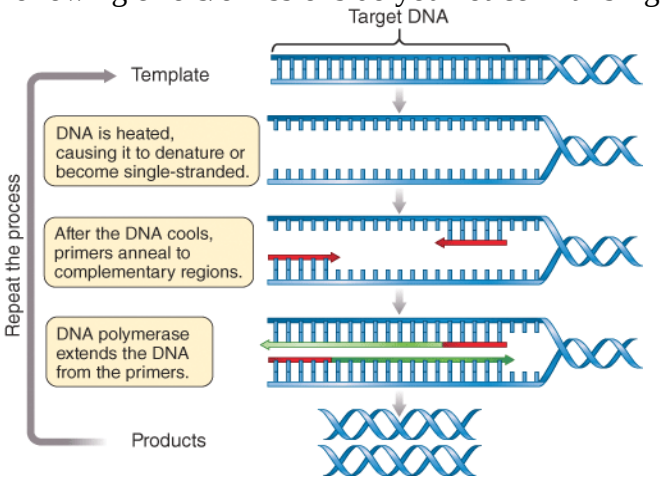
47) The SSU rRNA of an organism is a highly conserved molecule because of its (Select all that apply.)

a) interaction with multiple genes.
b) interaction with multiple ribosomal proteins.
c) interaction with multiple mRNA sequences.
d) vital role within the organism in facilitating protein synthesis.
e) vital role within the organism in facilitating chromosomal replication.

Answer 1: b
Answer 2: c
Answer 3: d

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

48) This figure represents an artist's attempt to illustrate the process of PCR. Which of the following errors/omissions do you notice in this figure? (Select all that apply.)



a) DNA strands are not fully denatured.
b) Primers are not shown in the illustration.
c) PCR products are not shown in the illustration.
d) Taq polymerase is not shown in the illustration.
e) dNTPs are not shown in the illustration.

Answer 1: a
Answer 2: d
Answer 3: e

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

49) You have found a novel microbe and want to classify it at the domain level. The new microbe has histones, no membrane-bound organelles, and a cell wall. Which other features are likely displayed by this microbe? (Select all that apply.)

a) RNA pol II
b) RNA pol II-like polymerase
c) RNA pol III
d) Single RNA polymerase
e) Nuclear membrane

Answer 1: b
Answer 2: d

Difficulty: Medium

Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

50) You have found a novel microbe and want to classify it at the domain level. The new microbe has RNA pol II-like activity, organelles, and a cell wall. Which other features are likely displayed by this microbe? (Select all that apply.)

a) RNA pol III
b) Histones
c) Novel plasma membrane
d) Single RNA polymerase
e) Nuclear membrane

Answer 1: a
Answer 2: b
Answer 3: e

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

51) You have found a novel microbe and want to classify it at the domain level. The new microbe has a single RNA polymerase, no membrane-bound organelles, and standard plasma membrane structure. Which other features are likely displayed by this microbe?

a) RNA pol I-like activity
b) RNA pol III-like activity
c) Histones
d) Nuclear membrane
e) Peptidoglycan cell wall

Answer: e

Difficulty: Medium
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

52) Which abilities might provide plausible mechanisms to explain the endosymbiont phenomenon? (Select all that apply.)

a) Development of a phagocytic capability by early eukaryal cells
b) Development of a phagocytic capability by primitive aerobically respiring bacteria
c) Development of membrane invasion by early eukaryal cells
d) Development of membrane invasion by primitive aerobically respiring bacteria

Answer 1: a
Answer 2: d

Difficulty: Hard
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

53) Which of these factors may facilitate the spread of infectious disease? (Select all that apply.)

a) Visitations from God
b) Unclean drinking water
c) Human migration
d) Poverty

Answer 1: b
Answer 2: c
Answer 3: d

Difficulty: Medium
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

54) Despite advances in medical science, there has been a slight increase in deaths from infectious disease in the United States in recent decades. Reasons for this increase may include (Select all that apply.)

a) bacterial resistance to antibiotics
b) emergence of new pathogens
c) decreased production of antibiotics
d) vaccine ineffectiveness
e) complacency over the use of vaccines

Answer 1: a
Answer 2: b
Answer 3: e

Difficulty: Medium
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

55) Which of these are key factors in explaining the similarity between death rates in the world versus sub-Saharan Africa in the 1930s? (Select all that apply.)

a) Global unavailability of effective antibiotics
b) Poverty of nations
c) Political instability
d) Lack of sanitation
e) Global unavailability of vaccines for endemic diseases

Answer 1: a
Answer 2: e

Difficulty: Medium
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

56) Which of these are key factors in explaining the discrepancy between death rates in the world versus sub-Saharan Africa in the 21st century? (Select all that apply.)

a) Global unavailability of effective antibiotics
b) Poverty of nations in sub-Saharan Africa
c) Political instability
d) Lack of sanitation
e) Global unavailability of vaccines for endemic diseases

Answer 1: b
Answer 2: c
Answer 3: d

Difficulty: Medium
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

Question Type: True/False

57) Polypeptides are the most abundant macromolecule in the cell on a dry weight basis.

Answer: True

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

58) DNA contributes about 2%–5% to the dry weight of the cell.

Answer: True

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

59) Viruses are able to infect all types of cellular life forms.

Answer: True

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

60) Microbial nitrogen fixation is the conversion of ammonia into dinitrogen gas.

Answer: False

Difficulty: Easy
Section Reference: Section 1.3 Microbial Ecology and Biotechnology
Learning Objective: LO 1.3 Discuss the various forms of microbial metabolism and the possible ways which microbes may interact with the environment, each other and other organisms.

61) The first person to describe bacteria observed under a microscope was Anton van Leeuwenhoek.

Answer: True

Difficulty: Easy

Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

Question Type: Text Entry

62) Macromolecules that catalyze chemical reactions in the cell are called _____.

Answer: enzymes

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

63) The main difference between the two cell types, prokaryote and eukaryote, is the presence of a(n) _____ in the eukaryote.

Answer: nucleus

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

64) The three domains of life are _____, _____, and _____.

Answer: Bacteria, Archaea, Eukarya

Difficulty: Easy
Section Reference: Section 1.1 The Microbes
Learning Objective: LO 1.1 Discuss what microbiology is and what separates it from other biological sciences.

65) The Miller-Urey experiment demonstrated that

a) heat could be used to extend the shelf life of certain products.
b) a sample from a diseased person could be used to provide immunity to another person.
c) the building blocks for living systems could have formed on Earth from small inorganic precursors.
d) bacteria could be used to produce medically important compounds.

e) bacteria in the environment readily pick up and swap genetic information.

Answer: c

Difficulty: Medium
Section Reference: Section 1.2 Microbial Physiology, Genetics, and Cultivation
Learning Objective: LO 1.2 Define the conserved model of genetic transfer of information found in all organisms on Earth, discussing the possible origins of life on Earth.

66) The production of human insulin by *E. coli* was made possible by _____.

Answer: recombinant DNA or recombinant DNA techniques

Difficulty: Medium
Section Reference: Section 1.3 Microbial Ecology and Biotechnology
Learning Objective: LO 1.3 Discuss the various forms of microbial metabolism and the possible ways which microbes may interact with the environment, each other and other organisms.

67) Biogeochemical cycling is the transitioning of various chemicals between organic and inorganic forms.

Answer: True

Difficulty: Easy
Section Reference: Section 1.3 Microbial Ecology and Biotechnology
Learning Objective: LO 1.3 Discuss the various forms of microbial metabolism and the possible ways which microbes may interact with the environment, each other and other organisms.

68) Who showed that you could expose a person to an inactivated or weakened version of a microbe, or even just a part of the microbe, to create immunity to a disease?

a) Louis Pasteur
b) Edward Jenner
c) Robert Koch
d) Alexander Fleming
e) Anton van Leeuwenhoek

Answer: b

Difficulty: Easy
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.

69) According to Dr. Paul Farmer, what is causing the "great epi divide"?

a) Lack of adequate health care
b) Lack of pasteurization
c) Lack of freezers
d) Lack of refrigerators
e) Lack of freezers and refrigerators

Answer: a

Difficulty: Easy
Section Reference: Section 1.4 Microbes and Disease
Learning Objective: LO 1.4 Discuss the work of microbiologists, like Louis Pasteur and Robert Koch, and the history of this exciting field that combines medicine and biology.