Molecular Biology- Principles and Practice 2e
Cox et. al
Chapter 1

1. The requirements of a living system include:
A. raw materials and energy.
B. catalysis of reactions.
C. a selective barrier.
D. biological information.
E. All of these choices are correct.

Answer: E
Section: 1.1
Level: Easy
Blooms: Knowledge

2. The cell keeps pH, temperature, and ion concentrations within a narrow window in order to maintain _____.

Answer: homeostasis
Section: 1.1
Level: Easy
Blooms: Knowledge

3. The process of synthesizing DNA from RNA is called:
A. reverse transcription.
B. transcription.
C. translation.
D. replication.

Answer: A
Section: 1.1
Level: Medium
Blooms: Knowledge

4. *Deinococcus radiodurans* is (select all that apply):
A. resistant to ionizing radiation.
B. able to repair DNA breaks without ATP.
C. killed via desiccation.
D. unique in its ability to withstand ionizing radiation.
E. adapted to withstand the desert environment.

Answer: A, E

Section: 1.1
Level: Medium
Blooms: Comprehension

5. Earth's early atmosphere contained (select all that apply):
A. methane.
B. water.
C. nitrogen.
D. hydrogen.
E. organic molecules.

Answer: A, B, C, D
Section: 1.1
Level: Easy
Blooms: Knowledge

6. The RNA World hypothesis is directly supported by all the following *except*:
A. catalytic RNAs.
B. ribozymes showing diverse function.
C. ribosome structure.
D. micelle to vesicle formation.

Answer: D
Section: 1.1
Level: Medium
Blooms: Comprehension

7. When a cell acquires a new function, it usually has acquired:
A. additional nutrients.
B. additional energy.
C. additional volume.
D. a new enzyme.

Answer: D
Section: 1.1
Level: Easy
Blooms: Knowledge

8. LUCA, the last universal common ancestor, is:
A. a prehistoric protozoan cell.
B. an embryonic cell (in fetus).
C. the simplest bacterial cell.

D. a cell from which all organisms descended.

Answer: D
Section: 1.1
Level: Medium
Blooms: Knowledge

9. Scientists currently theorize that:
A. it is possible to synthesize a simple cell similar to LUCA.
B. cells from the Archaea group are most similar to LUCA.
C. cells from the Bacteria group can be mutated so they revert to LUCA.
D. evolution created LUCA from the Archaea group.

Answer: A
Section: 1.1
Level: Hard
Blooms: Application

10. The three main groups of known organisms include (select all that apply):
A. Bacteria.
B. Archaea.
C. Eukaryotes.
D. Fungi.
E. Prokaryotes.

Answer: A, B, C
Section: 1.1
Level: Easy
Blooms: Knowledge

11. The two tenets of natural selection are (select all that apply):
A. sexual reproduction in a population.
B. variation in a population.
C. competition in a population.
D. increasing number of members in a population.

Answer: B, C
Section: 1.1
Level: Easy
Blooms: Knowledge

12. The process by which individuals best adapted to exploit the prevailing resources are the most likely to survive and reproduce is called _____.

Answer: Natural Selection
Section: 1.1
Level: Easy
Blooms: Knowledge

13. Theodosius Dobzhansky's writings encouraged scientists to (select all that apply):
A. incorporate evolution when discussing population genetics.
B. explain how mutations create opportunities for evolution.
C. understand cellular pathways in the context of evolution.
D. compare differences within species in the context of evolution.

Answer: A, B, C, D
Section: 1.1
Level: Hard
Blooms: Synthesis

14. Match each mechanism of horizontal gene transfer with its definition:

A. Transduction	i. DNA transfer between two linked bacterial cells
B. Transformation	ii. bacteria picks up environmental DNA
C. Conjugation	iii. gene transfer via a bacteriophage

Answer: A- iii, B- ii, C- i
Section: 1.1
Level: Hard
Blooms: Knowledge

15. Jacques Monod spoke of the "postulate of objectivity," which assumes that forces and phenomena in nature:
A. are not consistent.
B. cannot be predicted.
C. follow consistent rules.
D. often create different outcomes.

Answer: C
Section: 1.2
Level: Easy
Blooms: Knowledge

16. Scientists determine the structure of complex proteins primarily by:
A. model building and calculation.

B. exploration and observation.
C. inspiration .
D. serendipity.

Answer: A
Section: 1.2
Level: Medium
Blooms: Knowledge

17. RNA catalysis was discovered by Thomas Cech and his coworkers when the experimental control tube with only RNA and no protein showed enzymatic activity. This discovery would most likely be described as:
A. model building and calculation.
B. exploration and observation
C. inspiration.
D. serendipity.

Answer: D
Section: 1.2
Level: Medium
Blooms: Knowledge

18. A "peer-reviewed" research paper indicates that:
A. graphs and tables are included to prove data.
B. several authors are contributing similar papers in the same journal.
C. several authors have created the content.
D. experts in the field confirm the content reflects high quality work.

Answer: B
Section: 1.2
Level: Hard
Blooms: Comprehension