1.

Which one of the following has negligible mass?

A) Electron
B) Neutron
C) Proton
D) Atom
E) No answer

Answer: A)

---

2.

Let’s say that an element has eight protons, nine neutrons, and eight electrons. Its atomic number and atomic mass, respectively, are _____ and _____.

A) 8 and 16
B) 8 and 17
C) 9 and 16
D) 9 and 17
E) No answer

Answer: B)

---

3.

When the number of proton and the number of electron are unequal, the atom or molecule _____.

A) becomes part of a molecule
B) gains or loses a proton
C) is an ion
D) forms a covalent bond with another atom
E) No answer

Answer: C)

---

4.

What is the process by which monomers are joined together to produce polymers?

A) Amino acid formation
B) Monomerization
C) Dehydration reaction
D) Hydrolysis
E) No answer

Answer: C)

---

5.

The type of bond that forms to link monomers (such as monosaccharides and amino acids) into polymers (such as starch and proteins) is a(n) _____ bond.

A) hydrogen
B) peptide
C) van der Waals
D) covalent
E) No answer

Answer: D)

---

6.

Lipid molecules differ from other biological macromolecules in that they _____.

A) do not contain carbon
B) do not have specific shapes
C) are not truly polymers
D) are much larger
E) No answer

Answer: C)

---

7.

Which of the following terms can be correctly used to describe

compounds or materials that do not mix with water?

A) phospholipids
B) hydrogen-bonded
C) hydrophobic
D) hydrophilic
E) No answer

Answer: C)

---

8.

Which of the following structures or organelles is found in eukaryotic but not prokaryotic cells?

I. Mitochondria
II. Ribosomes
III. Plasma membrane

A) I
B) I and II
C) II and III
D) I, II and III
E) No answer

Answer: A)

---

9

What is the functional connection between the nuclear membrane, nuclear pores, and the nucleolus?

A) Membrane of the endoplasmic reticulum is produced in the nucleolus and leaves the nucleus through the nuclear pores.
B) The nucleolus contains messenger RNA (mRNA), which crosses the nuclear envelope through the nuclear pores.
C) The nucleolus is the connection between the nuclear membrane and the endoplasmic reticulum that permit ribosomes to assemble on the surface of the ER.
D) Subunits of ribosomes are assembled in the nucleolus and pass

through the nuclear membrane via the nuclear pores.
E) No answer

Answer: D)

---

10.

Which of the following statements about chloroplasts and/or mitochondria is true?

I. Chloroplasts and mitochondria can synthesize some of their own proteins.
II. Mitochondria, but not chloroplasts, contain their own DNAs that encode some of their proteins.
III. Chloroplasts have a double-membrane envelope and the internal thylakoid membranes.

A) I
B) I and II
C) I and III
D) II and III
E) No answer

Answer: C)

---

11.

What does the enzyme DNA polymerase synthesize in a cell?

A) a polypeptide using DNA as a template.
B) a strand of DNA using a polypeptide as a template.
C) a strand of DNA using DNA as a template.
D) a strand of mRNA using DNA as a template.
E) No answer

Answer: C)

---

12.

21.2% of the bases in a molecule of DNA are cytosine.

What percentage would be adenine?

A) 21.2%
B) 28.8%
C) 42.4%
D) 57.6%
E) No answer

Answer: B)

---

13.

The table shows the mode of action of two antibacterial drugs that can affect the synthesis of proteins.

| antibacterial drug | rifampicin | streptomycin |
|---|---|---|
| mode of action | binds to RNA polymerase | causes errors in translation |

If bacteria are treated with both drugs, what will be the immediate effects?

I. Transcription will stop, but faulty proteins may continue to be synthesized.
II. If translation has started, proteins may be faulty.
III. Translation will be inhibited.

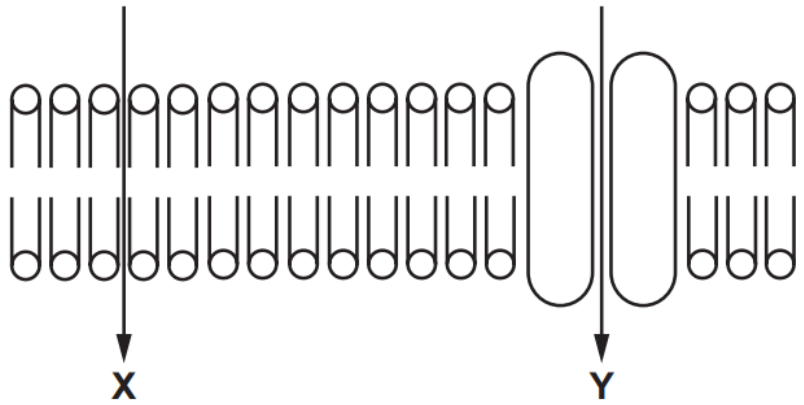
A) I
B) I and II
C) II and III
D) I, II and III
E) No answer

Answer: B)

---

14.

The diagram shows two pathways, X and Y, through which molecules can diffuse across a cell surface membrane.




Which one correctly shows possible pathways for (1) small hydrophobic molecules (such as $O_2$), (2) water and (3) glucose?

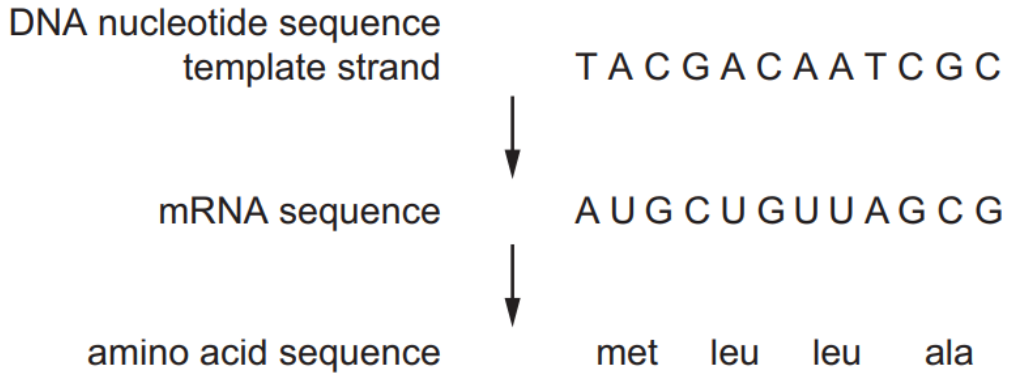
A) (1): X only, (2): Y only, (3) Y only
B) (1): X and Y, (2): X only, (3) X and Y
C) (1): X and Y, (2): X and Y, (3) X only
D) (1): X only, (2): X and Y, (3) Y only
E) No answer

Answer: D)

---

15.

The diagram shows the stages in the production of part of a polypeptide.




Which feature of the triplet code is illustrated by the information given?

A) There are some triplets that code for ‘start’ and ‘stop’.
B) The triplet code is universal for the DNA of all organisms.
C) The triplet code is non-overlapping and is only read in one direction.
D) An amino acid can be coded for by more than one triplet.
E) No answer

Answer: D)

---

16.

Which of the following is FALSE regarding sister chromatids?

A) Sister chromatids are attached to one another at the centromere.
B) Sister chromatids are created when DNA is replicated.
C) Each of the sister chromatids ends up in the same daughter cell after cell division.
D) Sister chromatids are separated during mitosis.
E) No answer

Answer: C)

---

17.

A cell entering the cell cycle with 32 chromosomes will produce two daughter cells. There would be _____ present in each of the daughter cells.

A) 16 chromosomes
B) 32 chromosomes

C) 64 chromosomes
D) 16 sister chromatids
E) No answer

Answer: B)

---

18.

Which of the following does NOT occur during mitosis?

A) replication of chromosomes
B) alignment of chromosomes along the cell's equator
C) the movement of chromosomes to opposite poles
D) condensation of chromatin
E) No answer

Answer: A)

---

19.

Let’s say there are 10 chromosomes in a diploid cell. Meiosis results in the production of daughter cells containing _____ chromosomes.

A) 5
B) 10
C) 20
D) 40
E) No answer

Answer: A)

---

20.

Let’s say there is a certain species of plant. Tall (R) is completely dominant to dwarf (r) in the plant.
If a homozygous dominant individual is crossed with a homozygous dwarf, the offspring will _____.
Assume the plant follows Mendel's principles of inheritance.

A) all be short
B) all be tall
C) be one-half tall and one-half dwarf
D) be three-quarters tall and one-quarter dwarf
E) No answer

Answer: B)

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