

Testbank Chapter 2. The Chemical Level of Organization

Multiple Choice

1. What are the major elements found in the body?
 - a. Nitrogen, oxygen, calcium, sodium
 - b. Hydrogen, carbon, phosphorus, calcium
 - c. Carbon, hydrogen, oxygen and nitrogen
 - d. Oxygen, nitrogen, potassium, calcium
 - e. Potassium, phosphorus, sodium, hydrogen

Ans: C

Difficulty: easy

Feedback: 2.1

2. The subatomic particles that make up atoms include:
 - a. Neutrons, quarks, muons
 - b. Protons, neutrons, electrons
 - c. Muons, positons, neutrons
 - d. Electrons, quarks, protons
 - e. Positons, protons, neutrons

Ans: B

Difficulty: easy

Feedback: 2.1

3. Which of the following particles has a neutral charge?
 - a. Neutron
 - b. Electron
 - c. Proton
 - d. All of the above

Ans: A

Difficulty: easy

Feedback: 2.1

4. What region of an atom contains the protons and neutrons?
- Cloud
 - Nucleus
 - Element
 - Ring
 - Shell

Ans: B

Difficulty: easy

Feedback: 2.1

5. This is the number of protons or electrons.
- Mass number
 - Atomic number
 - Isotope
 - Valence shell
 - None of the above

Ans: B

Difficulty: easy

Feedback: 2.1

6. As an atom's nucleus decays, it will emit radiation. This is seen in
- Compounds
 - Cations
 - Anions
 - Isotopes
 - Molecules

Ans: D

Difficulty: medium

Feedback: 2.1

7. This refers to the atomic weight of all naturally occurring isotopes of an element.
- Mass number
 - Atomic number
 - Atomic mass
 - Ionic mass
 - Covalent mass

Ans: C
Difficulty: medium
Feedback: 2.1

8. Describe a beneficial use of radiation?.

Ans: Radiation can be used for imaging purposes, create tracers and treatment of cancers by destroying cancer cells.
Difficulty: medium
Feedback: 2.1

Essay

9. Briefly describe the octet rule.

Ans: One atom is more likely to interact with another atom if doing so will leave both atoms with eight electrons in their valence shells.
Difficulty: medium
Feedback: 2.1

Multiple Choice

10. Which of the following particles plays a role in creating chemical bonds?

- Neutron
- Electron
- Proton
- All of the above

Ans: B
Difficulty: medium
Feedback: 2.2

11. This is a negatively charged atom.

- a. Superoxide
- b. Isotope
- c. Catalyst
- d. Ion
- e. Valence

Ans: D

Difficulty: easy

Feedback: 2.2

12. Which of the below provide an electrical current?.

- a. Isotope
- b. Ionic molecule
- c. Compound
- d. Electrolyte
- e. Valence molecule

Ans: D

Difficulty: easy

Feedback: 2.5

13. This type of bond requires a sharing of electrons.

- a. Covalent
- b. Ionic
- c. Hydrogen
- d. Atomic
- e. Electronic

Ans: A

Difficulty: easy

Feedback: 2.2

14. This is the type of bond between the atoms forming water

- a. Nonpolar covalent
- b. Polar covalent
- c. Hydrogen
- d. Ionic
- e. Atomic

Ans: B
Difficulty: medium
Feedback: 2.2

Essay

15. Describe a hydrogen bond.

Ans: Hydrogen bonds form between the slightly positively charged hydrogen atom and a slightly negatively charged atom, mostly oxygen or nitrogen.
Difficulty: medium
Feedback: 2.2

Multiple Choice

16. Which of the following bonds provides the three dimensional structure of large molecules like proteins and DNA?

- a. Nonpolar covalent
- b. Polar covalent
- c. Hydrogen
- d. Ionic
- e. Atomic

Ans: C
Difficulty: medium
Feedback: 2.5

17. This occurs when new bonds form or old bonds break between atoms.

- a. Ions
- b. Electrolytes
- c. Isotopes
- d. Chemical reaction
- e. Compounds

Ans: D

Difficulty: easy
Feedback: 2.2

18. This is defined as the capacity to do work.
- Metabolism
 - Electrolytes
 - Chemical reaction
 - Concentration
 - Energy

Ans: E
Difficulty: medium
Feedback: 2.3

Essay

19. Describe the law of conservation of energy.

Ans: Energy cannot be created or destroyed but it may be converted from one form to another form.
Difficulty: medium
Feedback: 2.3

Multiple Choice

20. This type of reaction will absorb more energy than it releases.
- Exergonic
 - Endergonic
 - Potential
 - Kinetic
 - Activation

Ans: B
Difficulty: easy
Feedback: 2.3

21. An enzyme acts to
- Raise the activation energy needed
 - Lower the activation energy needed
 - Convert the activation energy into potential
 - Convert the activation energy into kinetic
 - Break a chemical reaction

Ans: b

Difficulty: medium

Feedback: 2.3

Essay

22. Describe three factors that increase the rate of chemical reactions.

Ans: Three factors that promote reaction rates are the presence of enzymes (catalysts), increased concentration of reactants and increased temperature.

Difficulty: Hard

Feedback: 2.3

Multiple Choice

23. This type of reaction will combine reactants to produce larger products.
- Synthesis
 - Decomposition
 - Potential
 - Exchange
 - Activated

Ans: A

Difficulty: medium

Feedback: 2.3

24. This type of reaction will break larger reactants to produce smaller products.
- Synthesis
 - Decomposition
 - Potential
 - Exchange
 - Activated

Ans: B

Difficulty: medium

Feedback: 2.7

25. This is the most abundant and most important inorganic compound in the body.
- Water
 - Oxygen gas
 - Carbon dioxide
 - Glucose
 - DNA

Ans: A

Difficulty: easy

Feedback: 2.4

26. A solute that dissolves in water is.
- Hydrophobic
 - Hydrostatic
 - Hydroamoure
 - Hydrophillic
 - Hydrozone

Ans: D

Difficulty: easy

Feedback: 2.4

27. In a typical body solution, the solvent is.
- Glucose
 - Lipids
 - Carbon dioxide
 - Water
 - Electrolyte

Ans: D
Difficulty: easy
Feedback: 2.4

Essay

28. Describe the functions of water in the body.

Ans: Water is a solvent that allows transportation of solutes. Water acts in hydrolysis reactions to split reactants. Water can transport heat and, through sweating, releasing heat from the body. Water is used as a lubricant, particularly in serous fluids.

Difficulty: hard
Feedback: 2.4

Multiple Choice

29. A solution with a pH value smaller than 7 would be a(n)
a. Base
b. Salt
c. Acid
d. alkaline
e. concentrate

Ans: c
Difficulty: medium
Feedback: 2.4

30. A substance that adds or removes Hydrogen ions from a solution is a(n)
a. Base
b. Salt
c. Acid
d. alkaline
e. buffer

Ans: e
Difficulty: medium
Feedback: 2. 10

31. Which of the following is considered a proton donor?
- Acid
 - Base
 - Salt
 - Organic compound
 - Colloid

Ans: A
Difficulty: medium
Feedback: 2.4

32. These are specific arrangements of atoms that confer characteristic chemical properties upon organic molecules.
- Acids
 - Bases
 - Carbons
 - Functional groups
 - Isomers

Ans: D
Difficulty: medium
Feedback: 2.5

33. Glucose and fructose both have the chemical formula $C_6H_{12}O_6$ so they are considered
- Isotopes
 - Isometrics
 - Isolates
 - Isomers
 - Isotonics

Ans: D
Difficulty: medium
Feedback: 2.5

34. Which of the following is a monosaccharide that is important in producing energy.

- a. Glucose
- b. Sucrose
- c. Lactose
- d. Ribose
- e. Deoxyribose

Ans: A

Difficulty: medium

Feedback: 2.5

35. The major energy storage polysaccharide in humans is

- a. Cellulose
- b. Ribose
- c. Lipids
- d. Fats
- e. Glycogen

Ans: E

Difficulty: easy

Feedback: 2.5

36. This type of triglyceride contains more than one double bond in the fatty acid carbon atoms.

- a. Saturated
- b. Monounsaturated
- c. Polyunsaturated
- d. Acylglycerols
- e. Lipoprotein

Ans: C

Difficulty: medium

Feedback: 2.5

37. This type of lipid is the body's long term energy storage molecule.

- a. Steroid
- b. Phospholipid
- c. Cholesterol
- d. Triglyceride

e. Lipoprotein

Ans: D

Difficulty: medium

Feedback: 2.5

38. This type of lipid is used by the body to create hormones.

- a. Cellulose
- b. Phospholipid
- c. Cholesterol
- d. Triglyceride
- e. Lipoprotein

Ans: C

Difficulty: medium

Feedback: 2.5

39. Which of the following is NOT true about phospholipids?

- a. They contain an glycerol backbone
- b. The head group is polar
- c. The molecule is an important part of cell membranes
- d. The tail groups are nonpolar
- e. They are a major energy storage lipid

Ans: E

Difficulty: hard

Feedback: 2.5

40. Prostaglandins and leukotrienes are considered:

- a. Amphipathic
- b. Both Lipids and Eicosanoids
- c. Eicosanoids
- d. All of the above

Ans: D

Difficulty: medium

Feedback: 2.5

Essay

41. Describe what structures comprise an amino acid.

Ans: Amino acids contain a central carbon atom, an amino group, an acidic carboxyl group and a side chain.

Difficulty: medium

Feedback: 2.5

42. List the six major functions of proteins.

Ans: Proteins can be used for structure, regulation, contraction, immunology, transport and as a catalyst.

Difficulty: medium

Feedback: 2.5

Multiple Choice

43. The primary structure of a protein contains

- a. Alpha helix
- b. Beta-pleated sheets
- c. Substrates
- d. Amino acids
- e. All of the above

Ans: D

Difficulty: medium

Feedback: 2.5

Essay

44. List the three major properties of enzymes.

Ans: Enzymes are highly specific, efficient and subject to a variety of cellular controls.

Difficulty: medium

Feedback: 2.5

45. Describe what happens to a protein's structure and function when it is denatured.

Ans: The protein will become unraveled and lose its unique shape. Loss of that shape will destroy the proteins's function.

Difficulty: hard

Feedback: 2.5

Multiple Choice

46. Which of the following is a purine?

- a. Cytosine
- b. Guanine
- c. Thymine
- d. Ribose
- e. Phosphate

Ans: B

Difficulty: medium

Feedback: 2.5

47. Which is the function of RNA?

- a. Produce electrical impulses
- b. storage of energy
- c. transfer information for protein synthesis
- d. store information for protein synthesis
- e. transport of fluids

Ans: c

Difficulty: medium

Feedback: 2.5

48. Which is the function of DNA?
- a. Produce chemical signals
 - b. storage of energy
 - c. transfer information for protein synthesis
 - d. store information for protein synthesis
 - e. transport of electrolytes

Ans: d

Difficulty: medium

Feedback: 2.5

49. Which is the function of ATP?
- a. Produce electrical impulses
 - b. Transfers energy for cell functions
 - c. transfer information for protein synthesis
 - d. store information for protein synthesis
 - e. transport of fluids

Ans: b

Difficulty: medium

Feedback: 2.5

50. What monomer is used to build RNA and DNA?
- a. fatty acid
 - b. amino acid
 - c. Glucose
 - d. glycerol
 - e. nucleotide

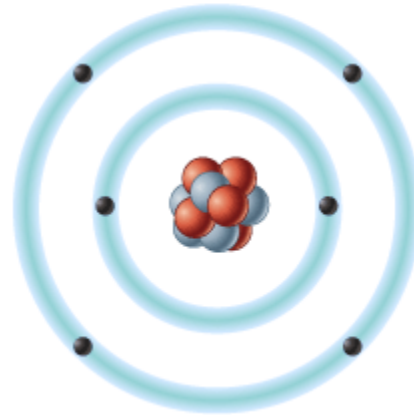
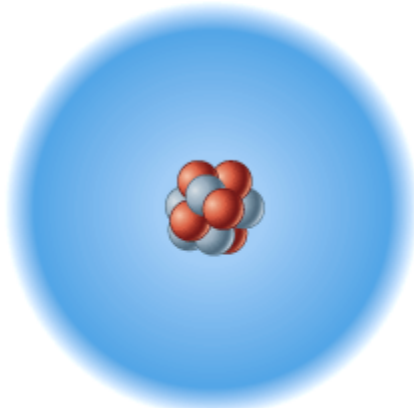
Ans: E

Difficulty: medium

Feedback: 2.5

51.

- A
- B
- C



In the diagram which particles are negatively charged?

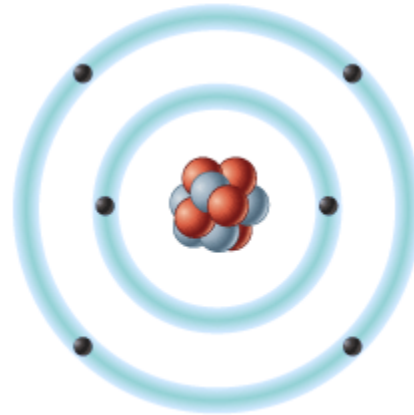
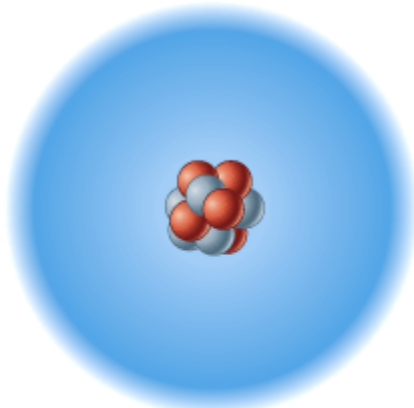
- a. A
- b. B
- c. C
- d. All of the above
- e. None of the above

Ans: C

Difficulty: easy

Feedback: 2.1

- A
- B
- C



In the diagram, which particles are positively charged?

- a. A
- b. B
- c. C
- d. All of the above
- e. None of the above

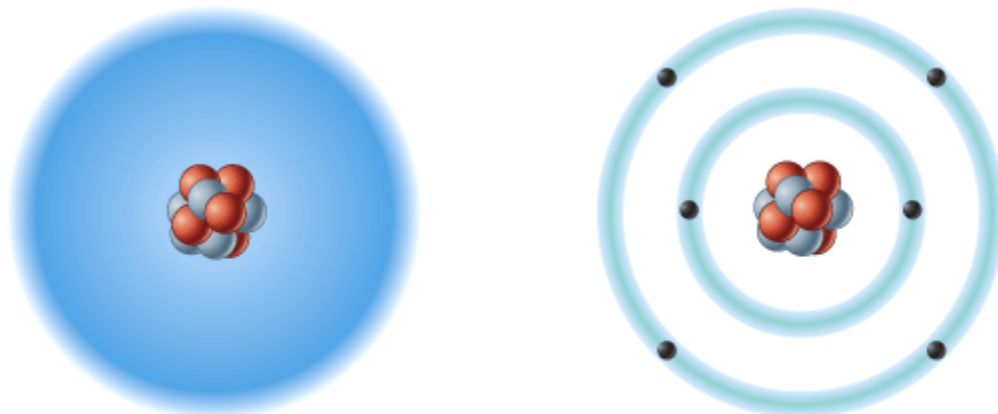
Ans: A

Difficulty: easy

Feedback: 2.

53.

- A
- B
- C



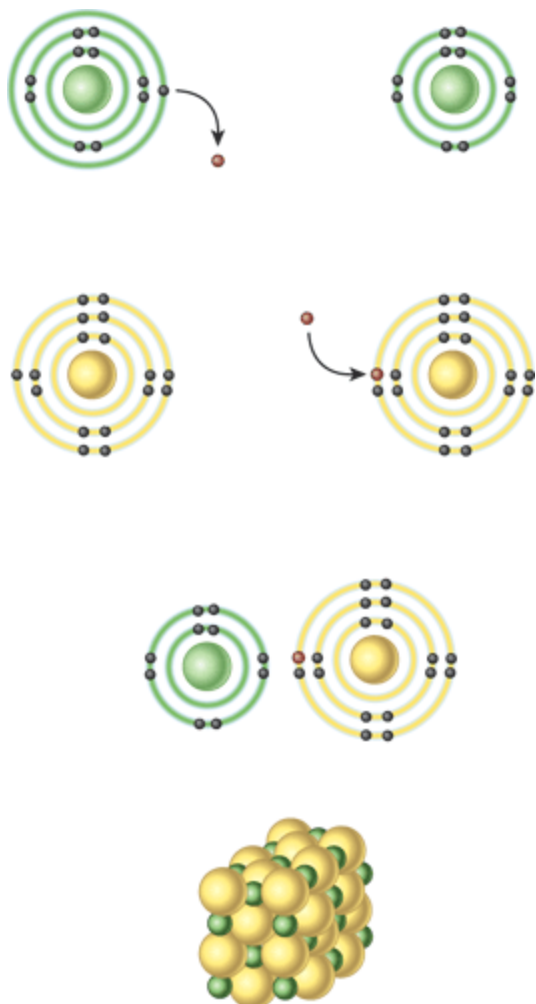
In the diagram, which particles have no charge?

- a. A
- b. B
- c. C
- d. All of the above
- e. None of the above

Ans: B

Difficulty: easy

Feedback: 2.1

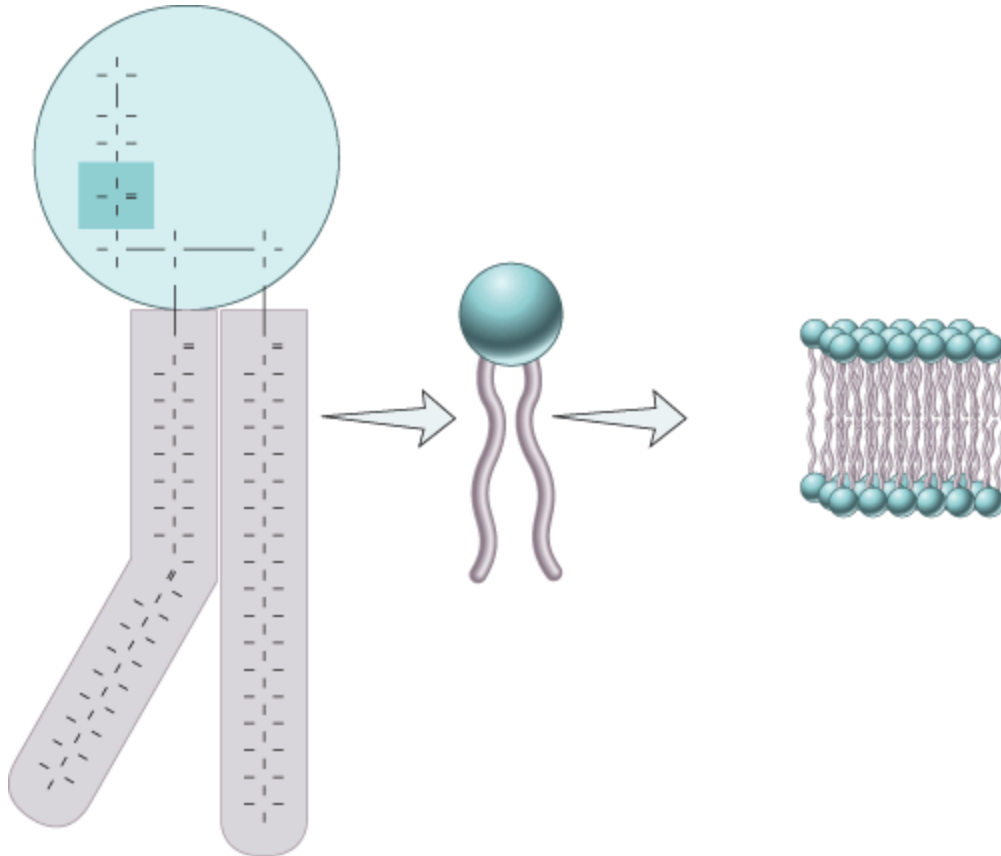


Give a brief description of what this diagram represents?

Ans: This diagram represents the octet rule in chemical bonding. The octet rule states that two atoms will tend to bond if doing so means that they will both be left with eight electrons in their valence shells.

Difficulty: medium

Feedback: 2.2

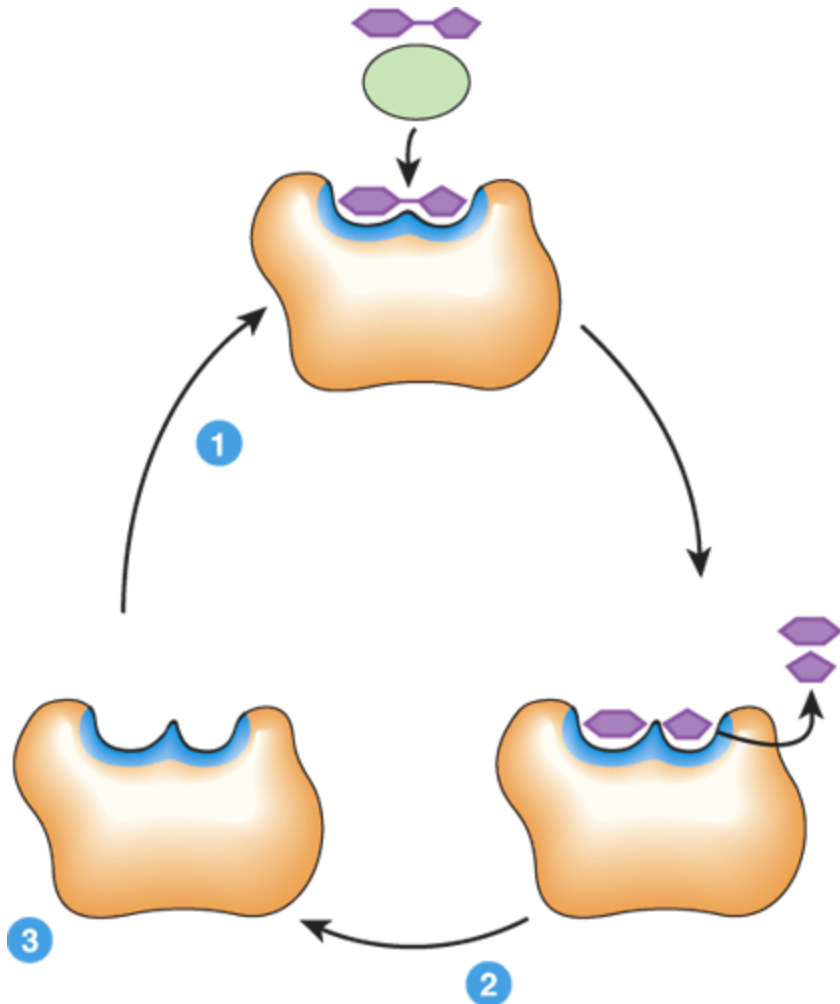


What is this molecule, where can it be found in a eukaryotic cell and what are the special properties of this molecule?

Ans: This is a phospholipid found in the plasma membranes of eukaryotic cells. It has a polar hydrophilic head group and a nonpolar hydrophobic tail group making it amphipathic.

Difficulty: medium

Feedback: 2.5



Describe what is happening at places 1,2 and 3 in the following figure.

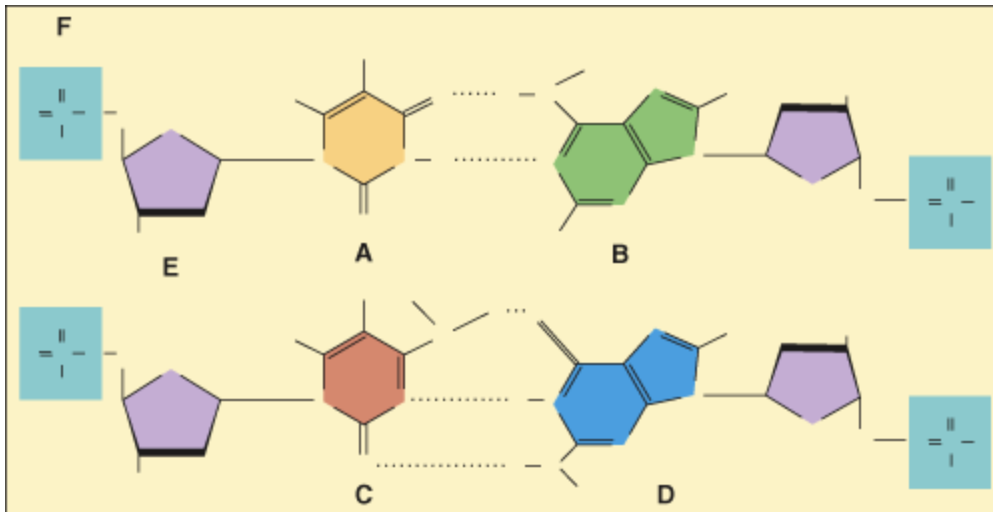
Ans: This figure represents how an enzyme works. At number one, the enzyme and substrate come together at the active site of the enzyme forming the enzyme-substrate complex. At number two, the enzyme catalyzes the reaction and transforms the substrate into products. At number three, the reaction is complete and the enzyme remains unchanged and free to catalyze the same reaction again on a new substrate.

Difficulty: hard

Feedback: 2.5

Multiple Choice

57.



In the diagram, which one is a purine?

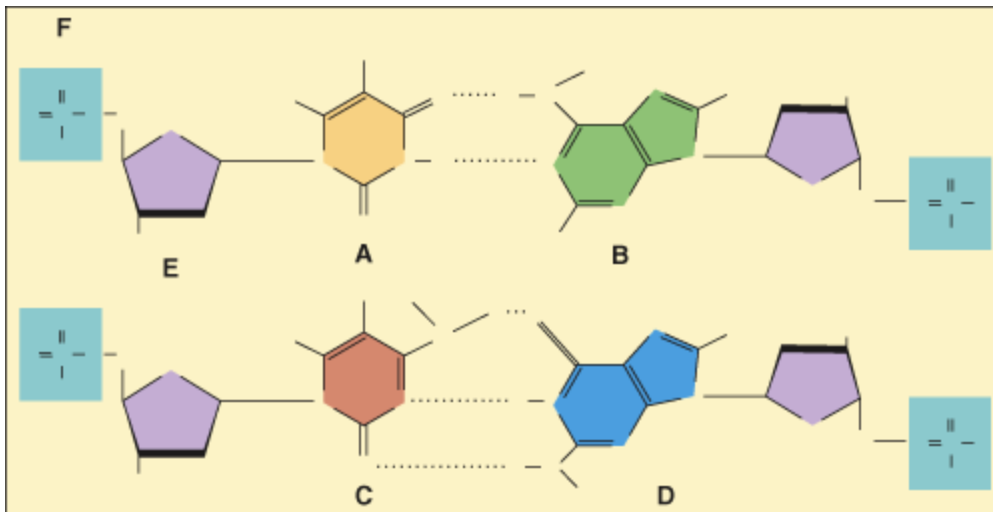
- A
- B
- E
- Both a and b
- All of the above

Ans: B

Difficulty: medium

Feedback: 2.5

58.



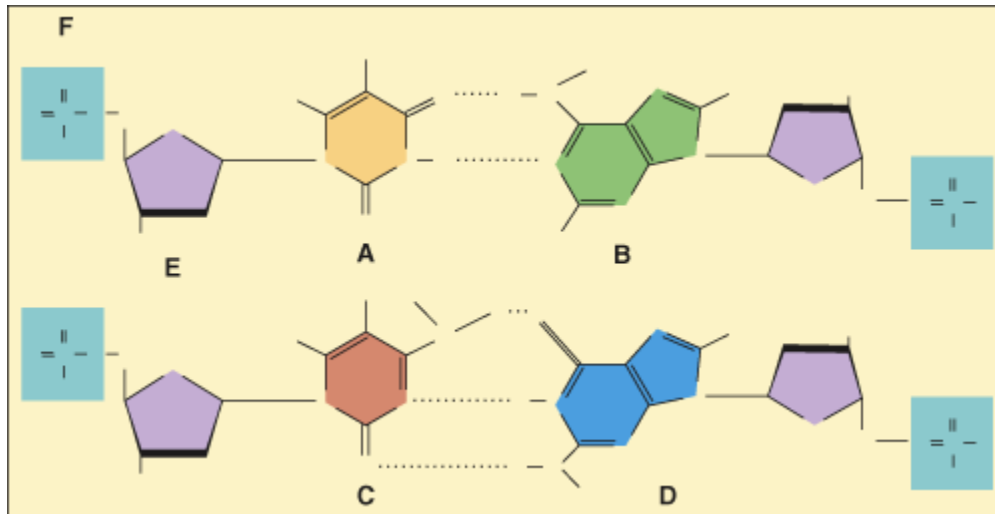
In the diagram, which one is deoxyribose?

- B
- E
- F

- d. None of the above
- e. The entire structure is considered a deoxyribose molecule

Ans: B
 Difficulty: medium
 Feedback: 2.5

59.



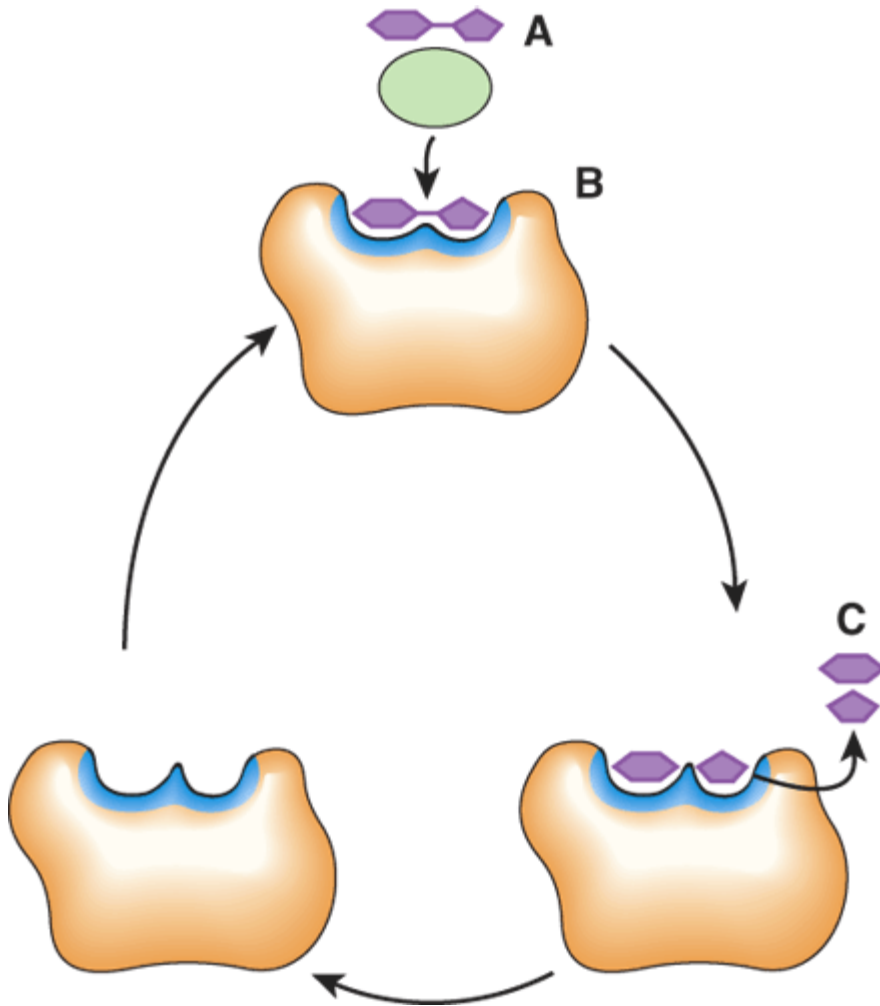
In the diagram, where is the pyrimidine?

- a. A
- b. B
- c. E
- d. F
- e. None of the above

Ans: A
 Difficulty: medium
 Feedback: 2.5

Essay

60. What is the difference between atomic mass, mass number and atomic number?



In the diagram, what would happen to the concentration of C if the concentration of A increases?

- Increases
- Decreases
- No change

Ans: A

Difficulty: medium

Feedback: 2.5

