الكيمياء-101

Chemistry-101

تحضيري-JU

شرح مع أسئلة الإختبارات

Ch-6.1

ملخصات يوسف زويل

تواصل مستمر مع أستاذ المادة لأي استفسار على الواتس 00966502047005

Chapter 6

6.1.1 cells transform energy as they perform work

Cells are small units, a chemical factory, housing thousands of chemical reactions

– The result of reactions is maintenance حفظ توازن of the cell, manufacture صنع of cellular parts and replication .

Energy

- Defined as the capacity to perform work and cause change.
- Or the capacity to rearrange matter .

1. (سؤال من اختبار سابق) Energy is ……

a) the capacity to perform work

b) the capacity to rearrange matter

c) A & B

d) None of the above

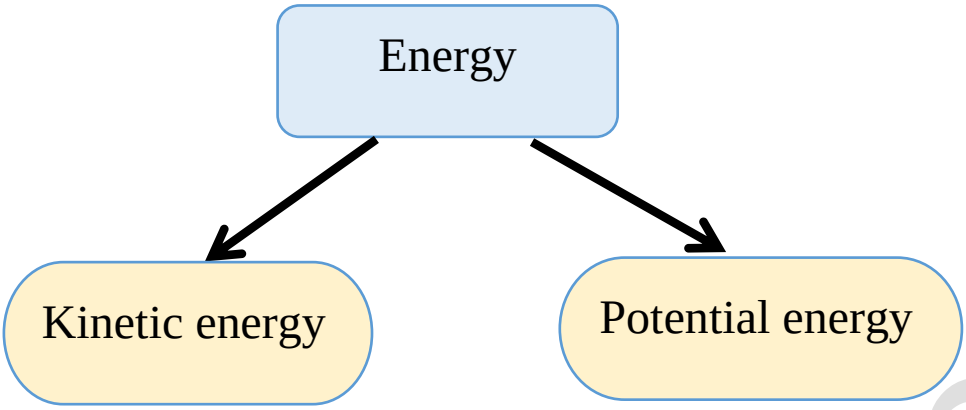
2.(سؤال من اختبار سابق) …….. is the capacity to perform work

a) Work

b) Energy

c) A & B

d) None of the above



Kinetic energy

- ✓ The energy of motion .

3. (سؤال من اختبار سابق) The energy of motion is ……

a) Potential energy

b) Chemical energy

c) Kinetic energy

d) None of the above

Heat or thermal energy

- ✓ Heat Is a form of kinetic energy associated with the random movement of atoms or molecules.
- ✓ Light is kind of kinetic energy that can be used to perform work.

Ex : light powering photosynthesis in green plants.

4. (سؤال من اختبار سابق)….is kind of kinetic energy that can be used to power photosynthesis

a) Gravity

b) Light

c) Heat

d) None of the above

Potential energy

The second form of energy ,is stored energy that an object possesses as a result of its position or location or structure .

Ex : water behind a dam.

Ex : energy stored in chemical bonds .

✓ Molecules possess potential energy because of the arrangement

Of their atoms.

5. (سؤال من اختبار سابق)The second form of energy ,is stored energy that an object possesses as a result of it's location or structure is ……

a) Chemical energy

b) Kinetic energy

c) Potential energy

d) Thermal energy

6. (سؤال من اختبار سابق) Molecules possess ……energy because of the arrangement of their atoms

a) Kinetic energy

b) Chemical energy

c) Potential energy

d) None of the above

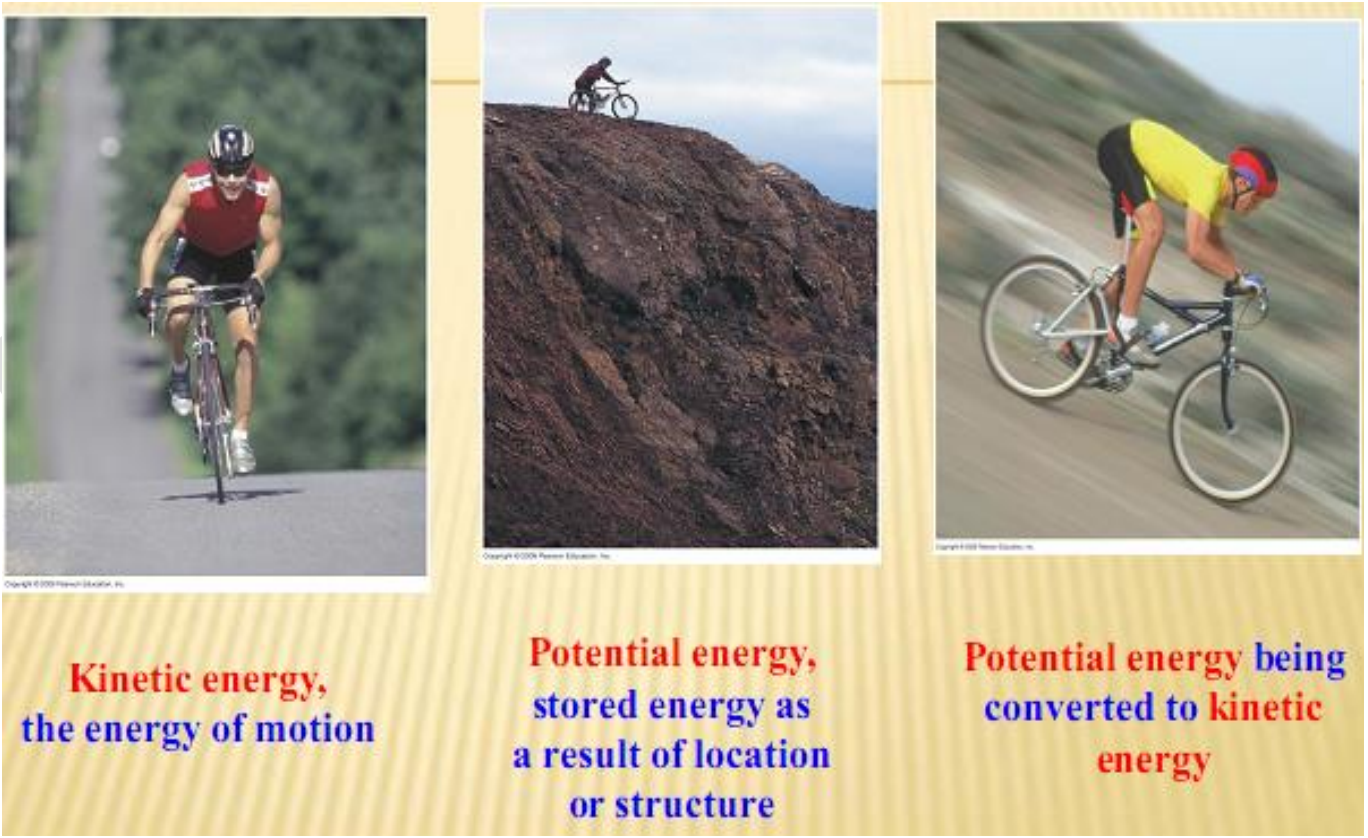
7.(سؤال من اختبار سابق) water behind a dam is an example for …..

a) Kinetic energy

b) Thermal energy

c) Potential energy

d) Chemical energy



8. (سؤال من اختبار سابق)Which of the followin is true?

- Potential energy is energy that an object possesses as a result of its position
- Heat is an example of Kinetic energy
- Light is an example of Kinetic energy
- all of the above

9. (سؤال من اختبار سابق)Which of the following is true?

- Kinetic energy is the energy of motion
- Light is an example of Potential energy
- food is an example of Kinetic energy
- none of the above

10. (سؤال من اختبار سابق)Which of the following is true?

- Light is an example of Kinetic energy
- Kinetic energy is energy that an object possesses as a result of its position
- Gasoline is an example of Kinetic energy
- none of the above

11. (سؤال من اختبار سابق)Which of the following is true?

- Light is an example of Kinetic energy
- Gasoline is an example of Potential energy
- Kinetic energy is energy that an object possesses as a result of its position
- First and second choice

Two Types of Energy Reactions

1.Endergonic Reactions:

2.Exergonic Reactions:

Endergonic Reactions

1.Endergonic Reactions: Chemical reaction that requires a net input of energy also known as Endothermic Reaction

Example: Photosynthesis.

Light energy

sun

photons

$$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$$

(glucose)

12.(سؤال من اختبار سابق) During photosynthesis _____

- oxygen is released
- oxygen is consumed
- carbon dioxide is released
- all of the above

13. (سؤال من اختبار سابق)Endergonic Reaction _____

- is known as Endothermic Reaction
- is a Chemical reaction that releases energy
- is known as Exothermic Reaction
- all of the above

14. (سؤال من اختبار سابق)During photosynthysis _____

- glucose is produced
- carbon dioxide is released
- protein is produced
- none of the above

Exergonic Reactions

Chemical reactions that releases energy also known as Exothermic Reaction.

Example: Cellular Respiration.

$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O +$ ATP

15.(سؤال من اختبار سابق) Exergonic Reaction _____

- is a Chemical reaction that releases energy
- is a Chemical reaction that requires a net input of energy
- is known as Endothermic Reaction
- First and second choice

16.(سؤال من اختبار سابق) During cellular respiration _____

- carbon dioxide is produced
- oxygen is released
- glucose is produced
- First and second choice

17. (سؤال من اختبار سابق)Exergonic Reaction _____

- is known as Exothermic Reaction
- is a Chemical reaction that requires a net input of energy
- is known as Endothermic Reaction
- First and second choice

18.(سؤال من اختبار سابق) During cellular respiration _____

- glucose is used
- carbon dioxide is consumed
- oxygen is released
- glucose is produced

19.(سؤال من اختبار سابق) During cellular respiration, Glucose becomes _____

- carbon dioxide
- oxygen
- ATP
- none of the above

20.(سؤال من اختبار سابق) Chemical reaction that releases energy is known as _____

- Exergonic Reaction
- Endergonic Reaction
- Endothermic Reaction
- none of the above

21.(سؤال من اختبار سابق) Metabolic reaction that releases energy is _____

- Exergonic Reaction
- Endergonic Reaction
- Endothermic Reaction
- First and second choice

22.(سؤال من اختبار سابق) During cellular respiration _____

- carbon dioxide is consumed
- carbon dioxide is produced
- oxygen is released
- glucose is produced

23. (سؤال من اختبار سابق)During cellular respiration _____

- oxygen is consumed
- carbon dioxide is consumed
- glucose is produced
-

Chapter 6

6.1.2 Metabolic reactions of cells

What is Metabolism?

- The sum total of the chemical activities of all cells.

✓ Two Types of Metabolism

1) Anabolic Pathways. Metabolic reactions, which consume energy (endergonic), to build complicated molecules from simpler compounds.

2) Catabolic Pathways. Metabolic reactions which release energy (exergonic) by breaking down complex molecules in simpler compounds.

1. Metabolic reaction that releases energy is _____

- Exergonic Reaction
- Endergonic Reaction
- Endothermic Reaction
- First and second choice

2. Metabolic reaction that releases energy is _____

- Endothermic Reaction
- Endergonic Reaction
- Anabolic Reaction
- Exothermic Reaction

3. Metabolic reaction that releases energy is _____

- Catabolic Reaction
- Exergonic Reaction
- Endergonic Reaction
- First and second choice

Note

Chemical reactions either release or store energy

The three main types of cellular work

Chemical work	Transport work	Mechanical work
driving endergonic reactions	pumping substances across membranes	beating of cilia

To accomplish work, a cell must manage its energy resources, and it does so by **energy coupling**— the use of exergonic processes to drive an essential endergonic one, its an important ability of all cells and ATP molecules are the key to energy coupling .

4. cells mange it's energy resources to accomplish work by using…….

a) Anabolic pathway

b) Catabolic pathway

c) Energy coupling

d) Non of the above

5. there are …… types of cellular work

a) 2

b) 3

c) 4

d) 5

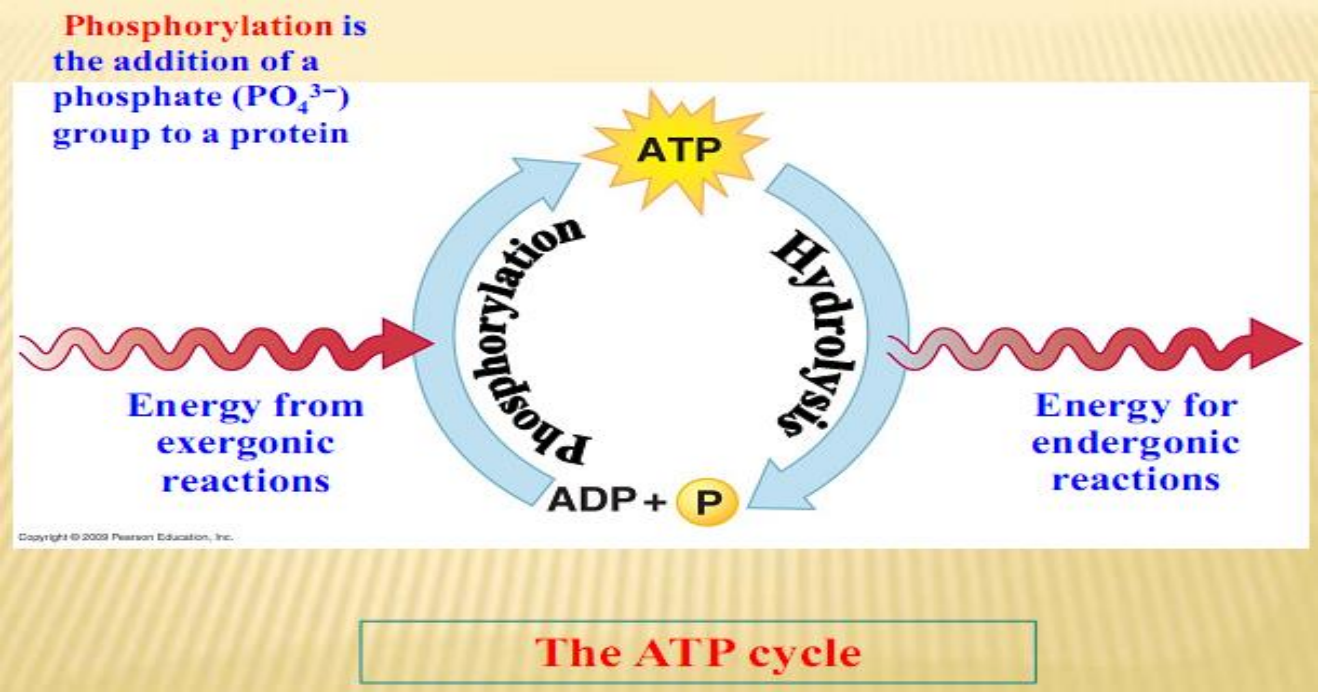
6. pumping substances across membrane called ……..

a) Chemical work

b) Mechanical work

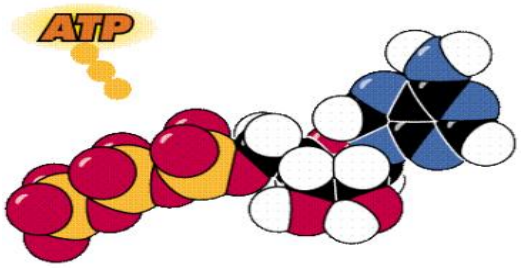
c) Transport work

d) Non of the above



The ATP cycle

Cellular energy - ATP



ATP shuttles ينقل chemical energy and drives cellular work

ATP

- ✓ Adenosine triphosphate, is the energy currency of cells.
- ✓ It is composed of adenine (a nitrogenous base), ribose (a five-carbon sugar), and three phosphate groups.
- ✓ ATP is the immediate source of energy that powers most forms of cellular work.

7. ATP is _____

- composed of ribose alone
- composed of ribose and three phosphate groups alone only
- composed of adenine, ribose , and three phosphate groups
- composed of adenine and ribose only

8. ATP is _____

- Adenosine Triphosphate
- composed of adenine and three phosphate groups only
- composed of ribose and three phosphate groups alone only
- none of the above

9. ATP is _____

- composed of ribose alone
- composed of adenine and three phosphate groups only
- composed of adenine and ribose only
- none of the above

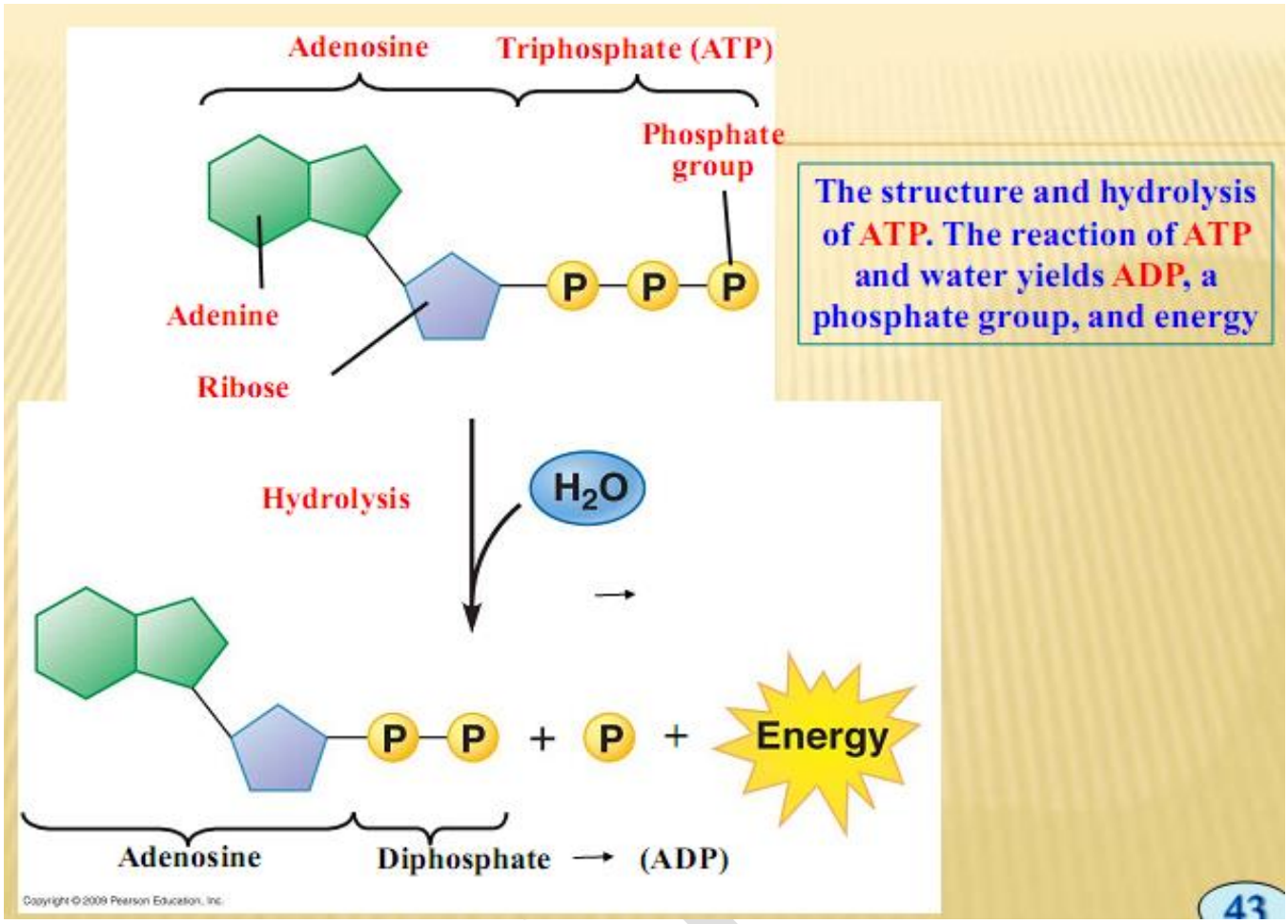
10. _____ is the energy currency

- Adenosine Triphosphate
- NAD
- FAD
- all of the above

Hydrolysis of ATP (reaction with water) releases energy by transferring its third phosphate from ATP to some other molecule

– This transfer of phosphate group is called **phosphorylation**

– In the process, ATP energizes تنشط molecules.



11. the hydrolysis of ATP …….

a) Releases energy

b) Transferring phosphate group

c) Require energy

d) a & b

12. The transfer of phosphate group is called ……

a) Phosphorylation

b) Metabolism

c) Cellular work

d) Non of the above

Chapter 6

6.1.3 Enzymes speed up the cell's chemical reactions

enzymes

- ✓ which are proteins that function as biological catalysts.
- ✓ increases speed of a chemical reaction without being consumed.
- ✓ Each enzyme is specific, has a particular target molecule called the substrate.

1. (سؤال من اختبار سابق) Enzyme _____
   - is not specific for substrate
   - is not consumed in the reaction
   - is a lipid
   - slows down the cell chemical reactions

2. (سؤال من اختبار سابق) Enzyme _____
   - has a particular target molecule called the substrate
   - is not consumed in the reaction
   - is not specific for substrate
   - First and second choice

3. (سؤال من اختبار سابق) Enzyme ___

- has a particular target molecule called the substrate
- is a protein
- is consumed in the reaction
- First and second choice

4. (سؤال من اختبار سابق) Enzyme _____

- is not specific for substrate
- is a carbohydrate
- is a lipid
- none of the above

5. (سؤال من اختبار سابق) Enzyme _____

- speeds up the cell chemical reactions
- is a lipid
- slows down the cell chemical reactions
- First and second choice

Note

The cell uses catalysis to drive (speed up) biological reactions.

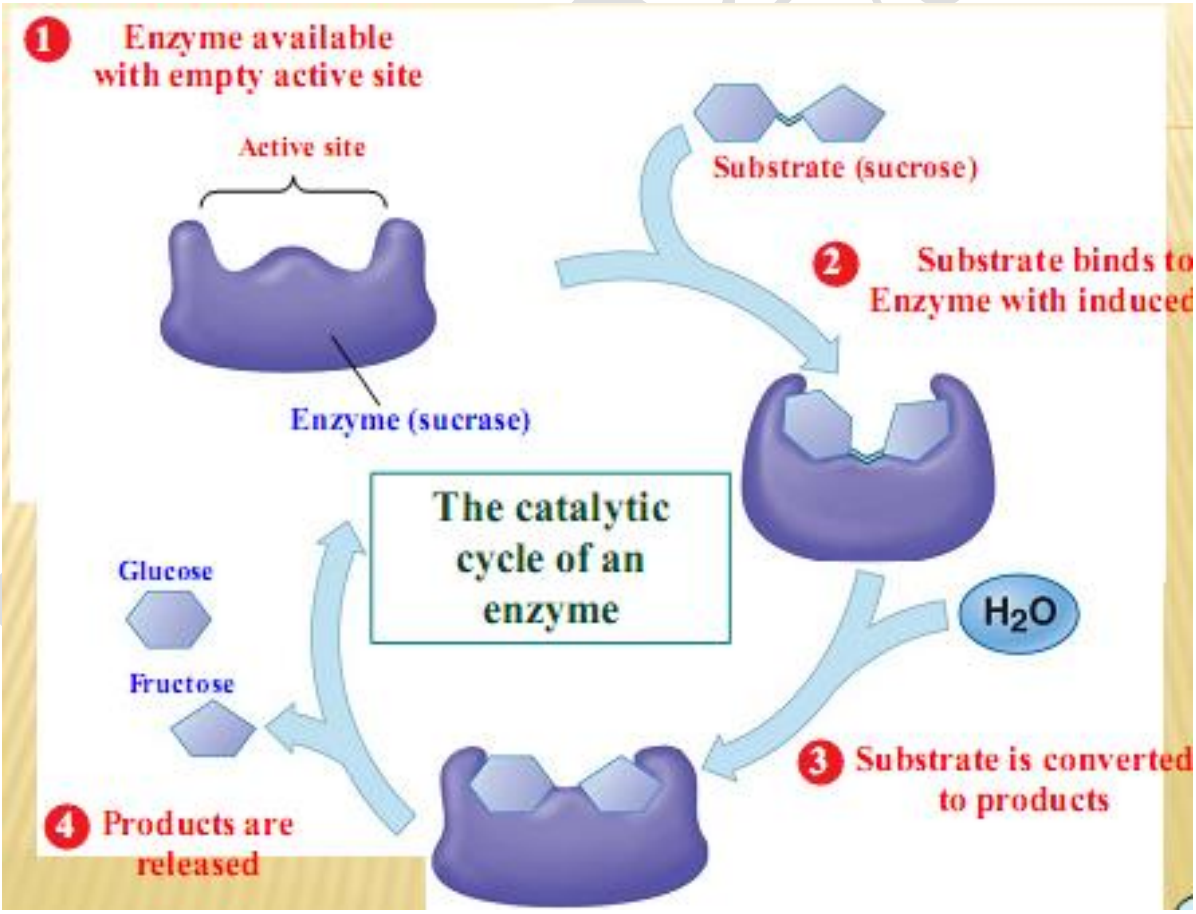
A specific enzyme catalyzes each cellular reaction.

Enzymes have unique three-dimensional shapes

The shape is critical to their role as biological catalysts.

– As a result of its shape, the enzyme has an active site where the enzyme interacts with the enzyme's substrate.

– Consequently, the substrate's chemistry is altered to form the product of the enzyme reaction.



Optimal conditions

For optimum activity, enzymes require certain environmental conditions.

– Temperature is very important, and optimally, human enzymes function best at 37ºC, or body temperature.

– High temperature will inactivate تعطيل or denature يفسد human enzymes .

– Enzymes also require a pH around neutrality المتعادل for best results.

6. (سؤال من اختبار سابق) Conditions at which Enzymes work best is called _____ conditions

- optimal
- maximum
- minimal
- First and second choice

7. (سؤال من اختبار سابق) Heat will cause Enzymes _____

- inactivation
- renaturation
- folding
- all of the above

8. (سؤال من اختبار سابق) Heat will cause Enzymes _____

- activation
- renaturation
- folding
- none of the above

Enzymes helpers

Some enzymes require non-protein helpers

– factors-Co are inorganic, such as zinc, iron, or copper.

– enzym-Coes are organic molecules and are often vitamins.

9. (سؤال من اختبار سابق) Inorganic Enzyme Helper is called _____

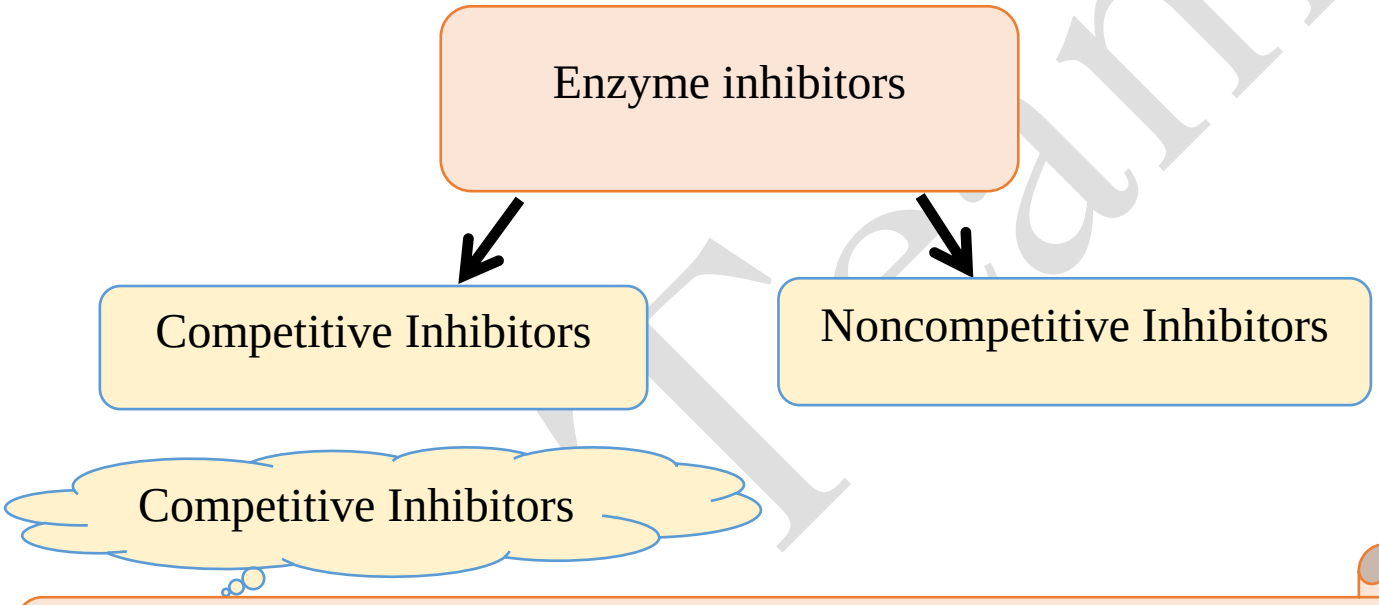
- Co-Helper
- Co-Enzyme
- Co-factor
- Enzyme Activator

10. (سؤال من اختبار سابق) Organic Enzyme Helper is called _____

- Co-Enzyme
- Co-Helper
- Enzyme Activator
- all of the above

11. (سؤال من اختبار سابق) Inorganic Enzyme Helper is called _____

- Co-Helper
- Enzyme Activator
- Co-Enzyme
- none of the above



Competitive Inhibitors

Inhibitors are chemicals that inhibit an enzyme's activity.

– One group inhibits because they compete for the enzyme's active site and thus block substrates from entering the active site.

– These are called competitive inhibitors.

12. (سؤال من اختبار سابق) Competitive Enzyme Inhibitor _____

- binds to active site
- binds to a site other than the active site
- changes the active site shape
- First and second choice

13. (سؤال من اختبار سابق) Competitive Enzyme Inhibitor _____

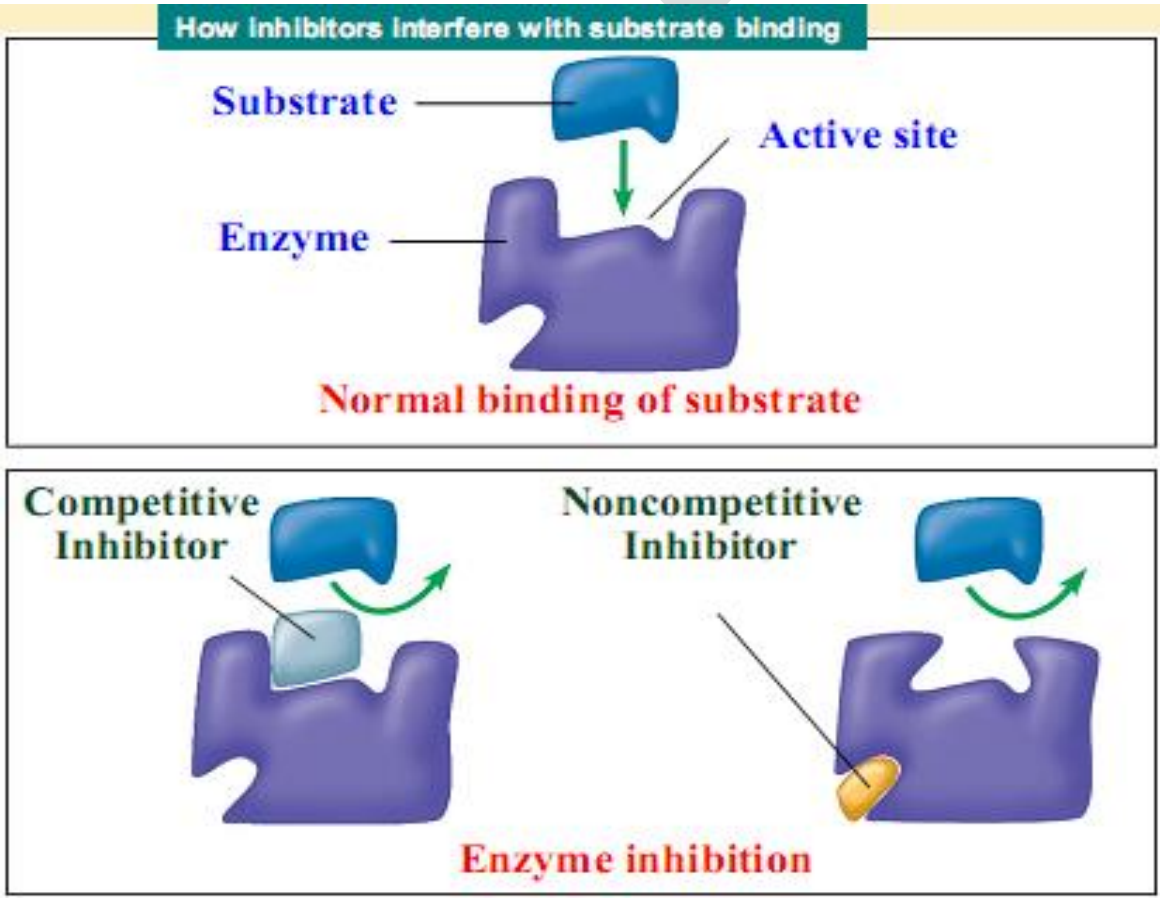
- block substrates from entering the active site
- binds to a site other than the active site
- changes the active site shape
- all of the above

Noncompetitive Inhibitors

Other inhibitors do not act directly with the active site.

– These bind somewhere else and change the shape of the enzyme so that the substrate will no longer fit the active site.

– These are called noncompetitive inhibitors.



14. (سؤال من اختبار سابق) Noncompetitive Enzyme Inhibitor _____

- changes the active site shape
- binds to active site
- acts directly with the active site
- all of the above

15. (سؤال من اختبار سابق) Noncompetitive Enzyme Inhibitor _____

- binds to a site other than the active site
- binds to active site
- acts directly with the active site
- First and second choice

Enzyme inhibitors

Enzyme inhibitors are important in regulating cell metabolism.

– Often the product of a metabolic pathway can serve as an inhibitor of one enzyme in the pathway, a mechanism called feedback inhibition.

– The more product formed, the greater the inhibition, and in this way, regulation of the pathway is accomplished.

16. (سؤال من اختبار سابق) Competitive Enzyme Inhibitor _____

- binds to active site
- block substrates from entering the active site
- binds to a site other than the active site
- First and second choice

Chapter 6

Bioenergetics

6.1.4 Transport across membranes

Membrane structure and function

- the biological membranes are composed of phospholipids bilayer and proteins .
- Many phospholipids are made from unsaturated fatty acids that have kinks in their tails.These kinks prevent phospholipids from packing tightly together, keeping them in liquid phospholipids form.

1) (سؤال من اختبار سابق) Phospholipids……

a) are a major part of cell membranes
b) cluster into a bilayer of phospholipids
c) are a minor part of cell membranes
d) a and b

2)(سؤال من اختبار سابق) Phospholipids are complex of ……

a) phosphate and proteins

b) Phosphate and unsaturated fatty acids

c) Phosphate and saturated fat

d) Proteins and lipids

3) (سؤال من اختبار سابق)The function of kinks in the phospholipids is….

a) allow phospholipids to packing tightly together

b) prevent phospholipids from packing tightly together

c) help in dissolving the molecules in the phospholipids

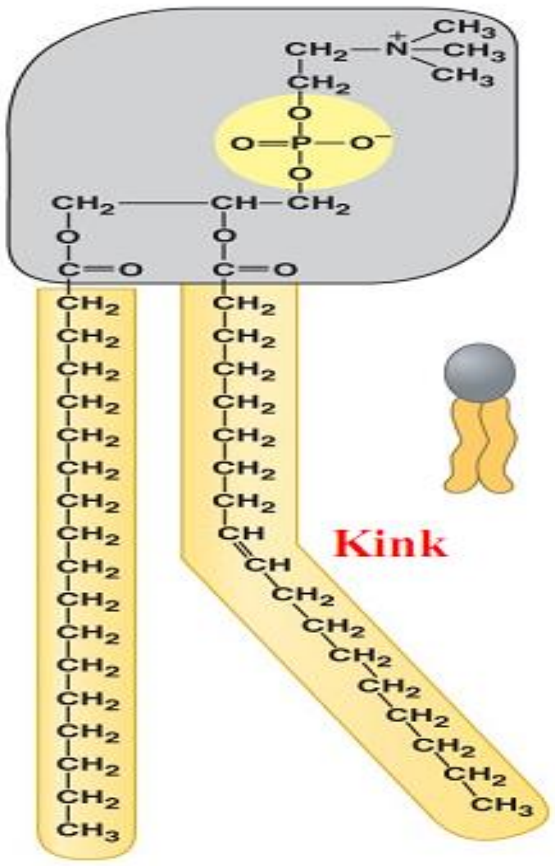
d) None of the above

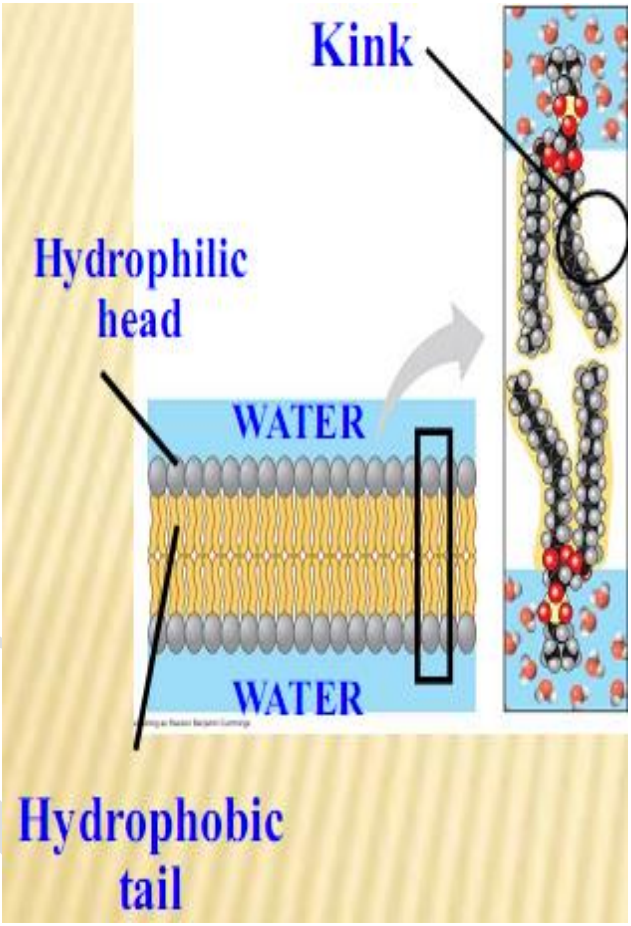
4)(سؤال من اختبار سابق) The biological membranes are composed of phospholipids …….

a) Triple layer
b) Bilayer
c) One layer
d) quadratic layer

- The membrane fluid phospholipid contains 2 fatty acid chains that are nonpolar.
- The tails are nonpolar and Head is polar & contains

a –PO4 group & glycerol.





5) (سؤال من اختبار سابق) The membrane fluid phospholipid contains ……. fatty acid chains that are nonpolar

a) Three
b) Four
c) Two
d) one

Membranes are a fluid mosaic of phospholipids proteins

Fluid

The membrane is fluid because individual phospholipids and proteins can move side-to-side within the layer, like it's a liquid.

- The fluidity of the membrane is aided by the steroid cholesterol wedged into the bilayer to help stabilize membranes at warmer temperatures and keep it liquid at lower temperatures.

6) (سؤال من اختبار سابق)The membrane components are…….

a) proteins

b) Lipids

c) Carbohydrates

d) all of the above

7) (سؤال من اختبار سابق)The steroid cholesterol wedged into the bilayer helps to ……..

a) Stabilize membranes at lower temperatures and keep the membrane fluid at warmer temperatures

b) Stabilize the membrane and it's fluids at the same temperature

c) To keep the membrane and the fluid at high temperature

d) Stabilize membranes at warmer temperatures and keep the membrane fluid at lower temperatures

8)(سؤال من اختبار سابق) The fluidity of the membrane is aided by ……wedged into the bilayer to help stabilize

a) The amino acid of proteins

b) Carbohydrates

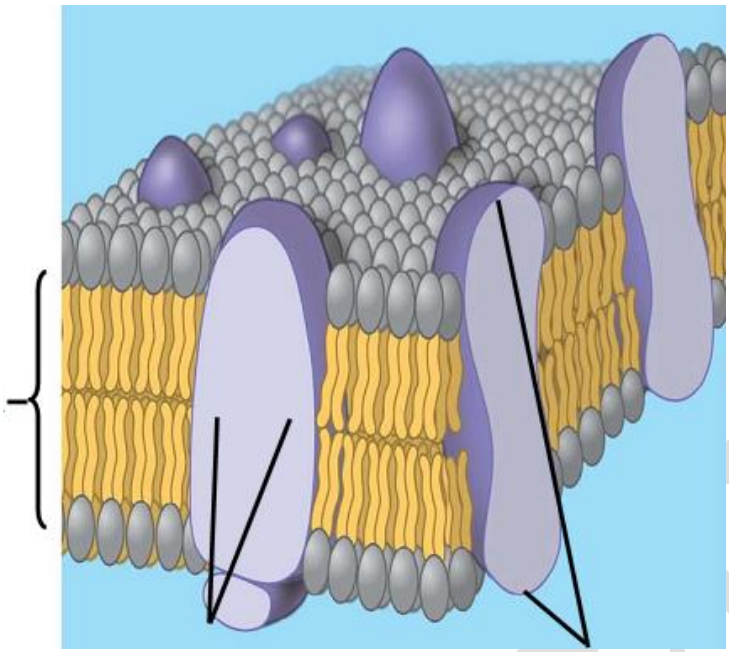
c) the steroid cholesterol

d) None of the above

Mosaic

because of the pattern produced by the scattered protein molecules embedded in the phospholipids when the membrane is viewed from above.

- A membrane is a mosaic this means that it has diverse protein molecules embedded in a framework of phospholipids.



The fluid mosaic for membranes

9)(سؤال من اختبار سابق) "Mosaic " mean ……..

a) Different

b) The same

c) Typical

d) None of the above

10) (سؤال من اختبار سابق)the membrane is……means it has diverse protein molecules embedded in a framework of phospholipids.

a) _Fluid

b)Mosaic

c) Elastic

d) Smooth

Chapter 6

Bioenergetics

6.1.5 Proteins function in the cell

Many membrane proteins function as:

- **Enzymatic activity:**

Some membrane proteins function as enzymes

- **Transport**

bring food molecules inside and maintain ion concentration.

- **Bind cells together (junctions)**

Membrane proteins may participate in the intercellular junctions.

1) (سؤال من اختبار سابق) Which of the following is a function of plasma Membrane ?

- Hormones
- Replication
- **Enzymatic activity**
- Transcription

2) (سؤال من اختبار سابق) some proteins of cell membrane function as ……..

a) Junction between cells
b) Enzymes
c) maintaining ion concentration
d) <u>All of the above</u>

- ***Protective barrier***

Surround cells to hold enzymes and metabolites inside.

- ***Regulate transport in & out of cell (selectively permeable)***

Membranes may exhibit selective permeability allowing some substances to cross more easily than others.

- ***Allow cell recognition***

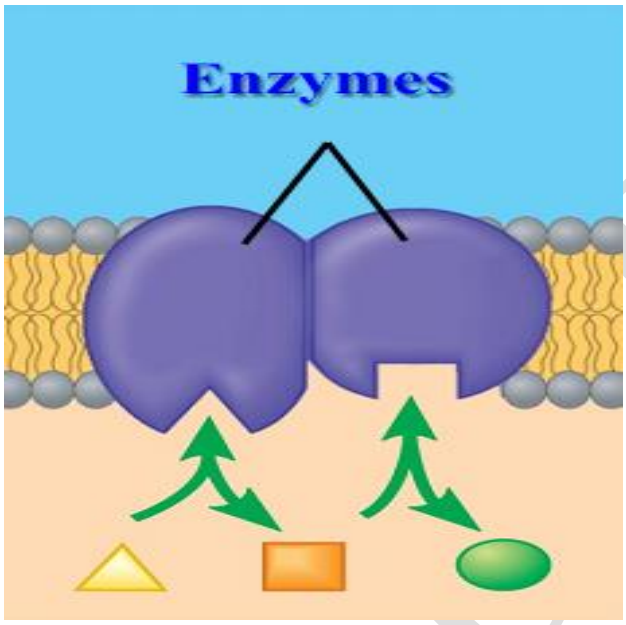
For example ; for hormones and other cells…… etc.

- ***Signal transduction***

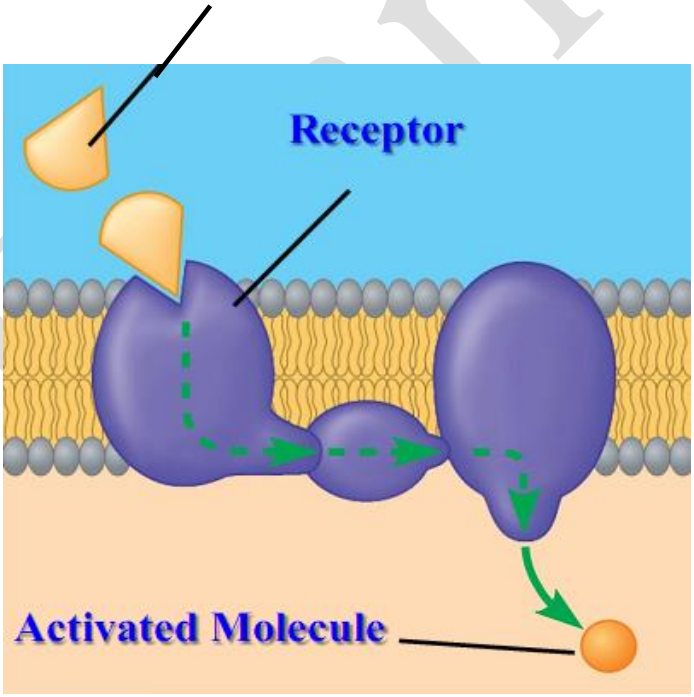
- ***Some proteins give the membrane a stronger framework*** these proteins called integrins, span the membrane and attach to the cytoskeleton on the inside and the extra cellular matrix (ECM) on the outside.

3) (سؤال من اختبار سابق) Proteins that give the membrane a stronger framework called .....

a) Purines
b) glycoproteins
c) Glycolipids
d) Integrin



Enzyme activity



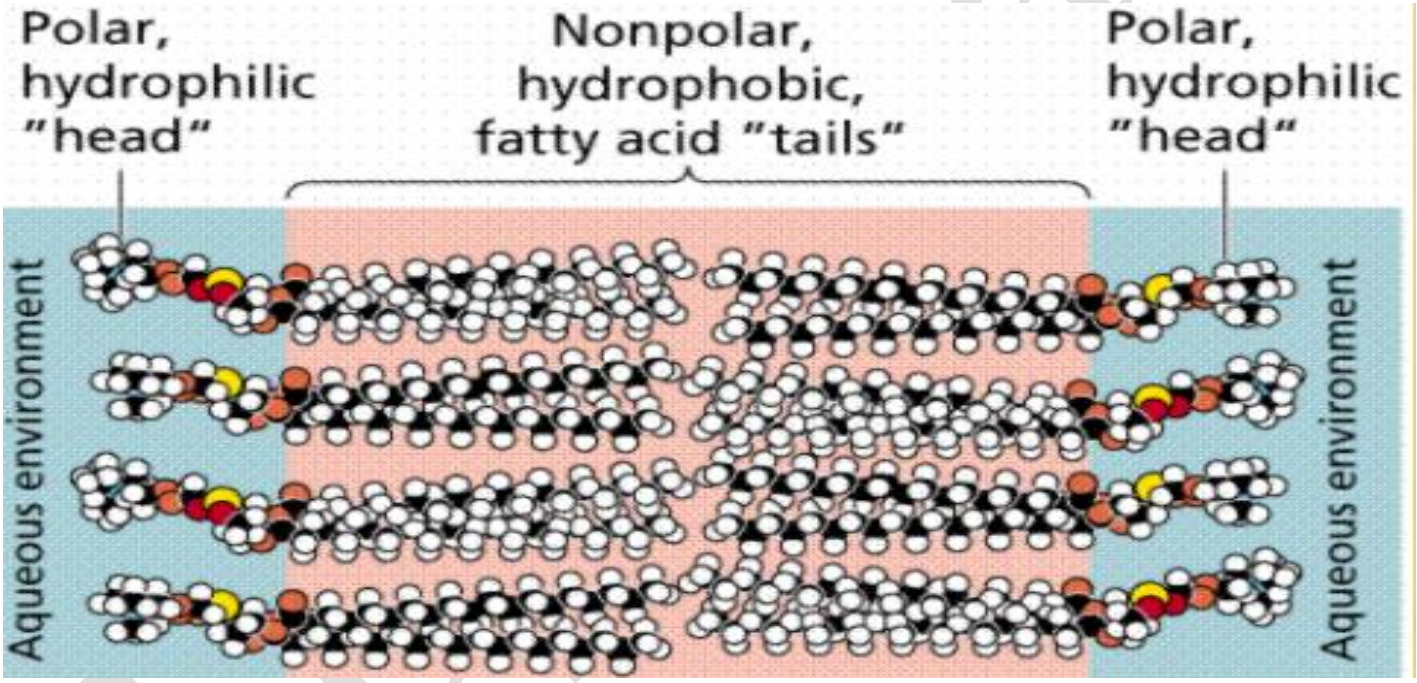
Signal transduction

selective permeability

Is the ability of membranes to allow some substances to cross or be transported more easily than others.

For examples:

- **Nonpolar hydrophobic molecules,** Materials that are soluble in lipids can pass through the cell membrane easily.
- **Small molecules** e.g. O_2, CO_2, H_2O move through easily.
- **Ions , Polar hydrophilic molecules** larger than water (glucose, other sugars and amino acids) do not cross easily on their own.



4) (سؤال من اختبار سابق) the ability of membranes to allow some substances to cross or be transported more easily than others

a) Permeability

b) Selective permeability

c) Impermeability

d) None of the above

5) (سؤال من اختبار سابق) O_2 and CO_2 are ……..

a) Small and polar molecules

b) Large and polar molecules

c) Small and nonpolar molecules

d) None of above

6)(سؤال من اختبار سابق) Non polar molecules such as O_2 and CO_2 ……

a) Cannot pass to the cells by passive transport

b) Move by active transport

c) Diffuse easily

d) Require ATP

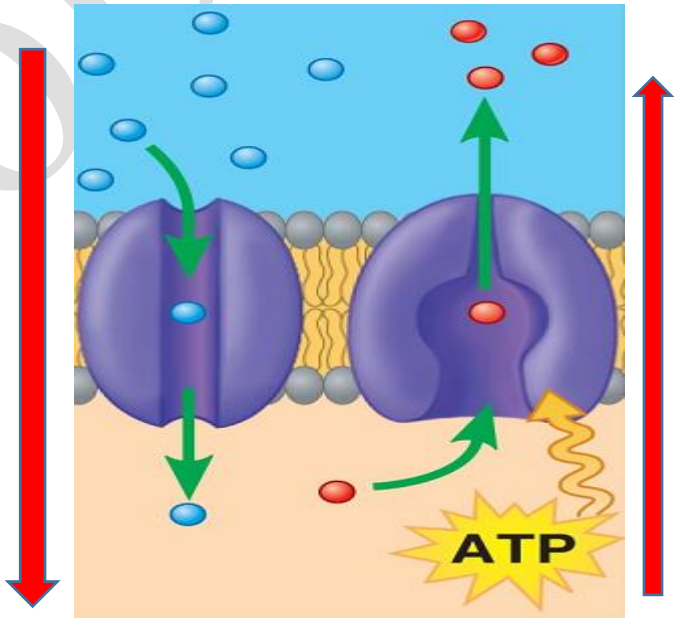
Chapter 6

Bioenergetics

6.1.6 Types of transport across cell membranes

- **Requires no energy**
  - **Diffusion**
  - **Passive transport**
- **Requires energy**
  - **Active transport**

Concentration gradient



High concentration

Active transport

Low concentration

Passive transport

Transport

Diffusion:

Is the net movement of substance down its concentration gradient from region of more concentrated particles to region where they are less concentrated.

- Does not use direct metabolic energy
- Is a process in which particles spread out evenly in an available space.
- This means that particles diffuse down their concentration gradient, molecules move because they have a natural
- **KINETIC ENERGY .**
- Eventually, the particles reach equilibrium where the concentration of particles is the same throughout.

Eventually, the particles reach equilibrium where the concentration of particles is the same throughout. At this dynamic equilibrium, molecules still move back and forth, but there is no net change in concentration on either side of the membrane.

1) (سؤال من اختبار سابق)the tendency of particles to spread out evenly in an available space is called……

a) Active transport

b) Refraction

c) Diffusion

d) diffraction

2)(سؤال من اختبار سابق) In the diffusion the particles move from…..

a) Low to high concentration

b) High to high concentration

c) High to low concentration

d) None of above

3)(سؤال من اختبار سابق) At the dynamic equilibrium the molecules…..

a) Still in a stationary phase

b) Move back and forth with increase in concentration

c) Move back and forth with no net change in concentration

d) Move back and forth with decrease in concentration

4)(سؤال من اختبار سابق) Down concentration gradient mean…….

a) From high concentration to low

b) From high concentration to high

c) From low concentration to high

d) From low concentration to low

Passive transport

Is the diffusion of a substance across a biological cell membrane that does not require energy.

- The concentration gradient itself represents potential energy for diffusion.

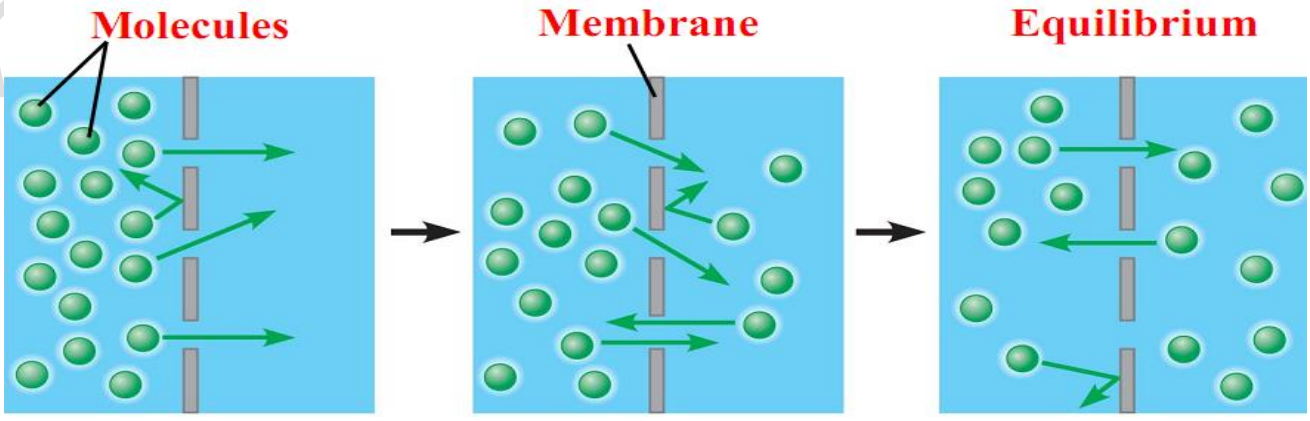
Passive diffusion could be :

1) **simple diffusion :** example: oxygen or water diffusing into a cell and carbon dioxide diffusing out.

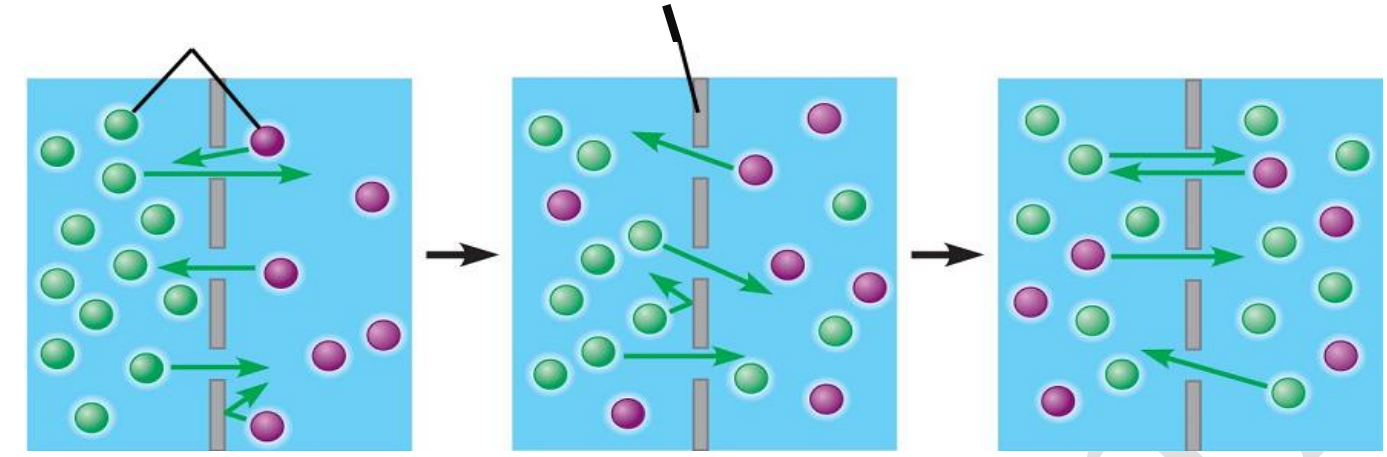
2) **Facilitated diffusion :** uses transport proteins to move high to low concentration

Examples: Glucose or amino acids moving from blood into a cell.

Passive transport (simple diffusion)



Passive transport of one type of molecules



Passive transport of two types of diffusion

5)(سؤال من اختبار سابق) The diffusion of a substance across a biological membrane that does not require energy called…..

a) Diffusion
b) Active transport
c) Diffraction
d) Passive transport

6)(سؤال من اختبار سابق) Facilitated Passive transport …….

a) goes from high concentration to low concentration
b) requires energy
c) requires ATP
d) all of the above

7) (سؤال من اختبار سابق) Passive transport ……

a) does not require energy
b) Does not requires ATP
c) requires ATP
d) a & c

8)(سؤال من اختبار سابق) Our cells get rid of …….. As a metabolic waste of respiration

a) O_2
b) NO_2
c) CO_2
d) SO_2

9)(سؤال من اختبار سابق) Example of metabolic waste of cells….

a) O_2
b) CO_2
c) Proteins
d) lipids

10) (سؤال من اختبار سابق)diffusion across a membrane called passive transport because……

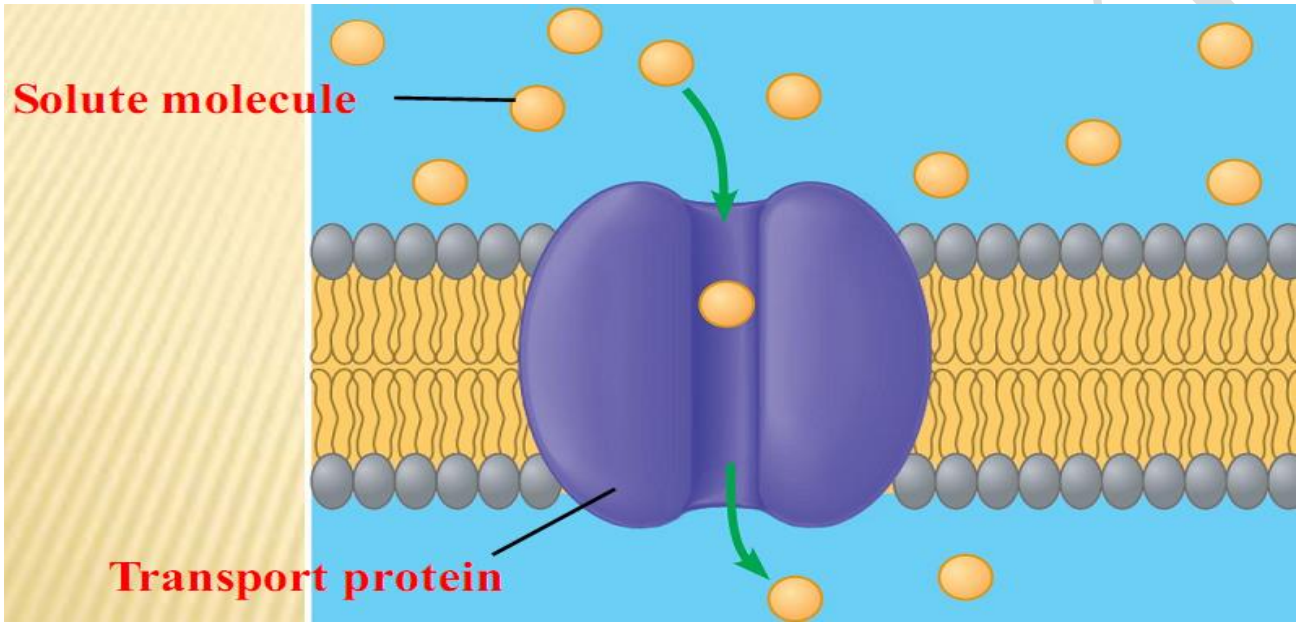
a) It require ATP
b) It require ADP
c) It require energy
d) It does not require energy

11) (سؤال من اختبار سابق)a substance diffuse independently this mean……

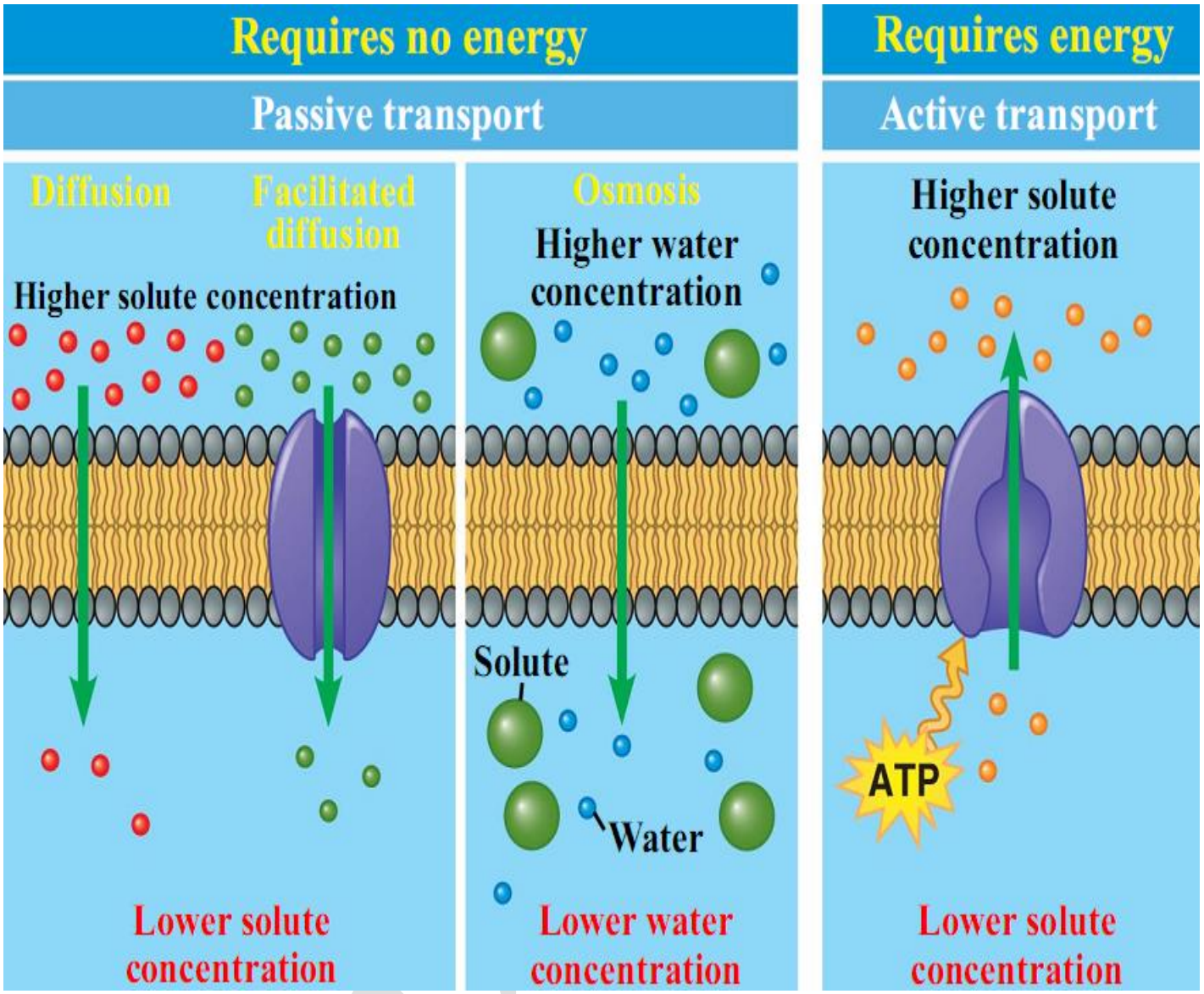
a) It require ATP
b) It require no energy
c) It require no ATP
d) b & c

12. (سؤال من اختبار سابق) Passive transport across cell membranes _____.

a) **goes from high concentration to low concentration**
b) goes from low concentration to high concentration
c) requires ATP
d) all of the above



Transport protein providing a channel for the diffusion of a specific solute across a membrane


Requires no energy
Requires energy
Passive transport
Active transport
Diffusion
Facilitated diffusion
Higher solute concentration
Lower solute concentration
Osmosis
Higher water concentration
Solute
Water
Lower water concentration
Higher solute concentration
ATP
Lower solute concentration

Chapter 6

6.1.7 Bioenergetics

Active transport:

Is the movement of molecules across a cell membrane from a region of their lower concentration to a region of higher concentration in the direction against their gradient.

- Requires energy or ATP
- The mechanism alters the shape oh the membrane protein through phosphorylation using ATP
- Active transport is associated with accumulating high concentration of molecules that the cell needs, such as ions, glucose and amino acids

1)(سؤال من اختبار سابق) The movement of molecules across a cell membrane from a region of their lower concentration to a region of higher concentration is called…..

a) Passive transport
b) Diffusion
c) Active transport
d) None of above

2) (سؤال من اختبار سابق)Active transport is……..

a) Transport of molecules from higher to lower concentration with ATP

b) Transport of molecules from higher to lower concentration without ATP

c) Transport of molecules from lower to higher concentration with ATP

d) Transport of molecules from lower to higher concentration without ATP

3) (سؤال من اختبار سابق)Active transport require…..

a) No ATP

b) ATP

c) Energy

d) b & c

4) (سؤال من اختبار سابق)Active transport is associated with accumulating……

a) low concentration of the molecules

b) high concentration of the molecules

c) ATP

d) None of above

5) (سؤال من اختبار سابق)ATP is

a) composed of ribose alone

b) composed of ribose and three phosphate groups alone only

c) composed of adenine, ribose , and three phosphate groups

d) composed of adenine and ribose only

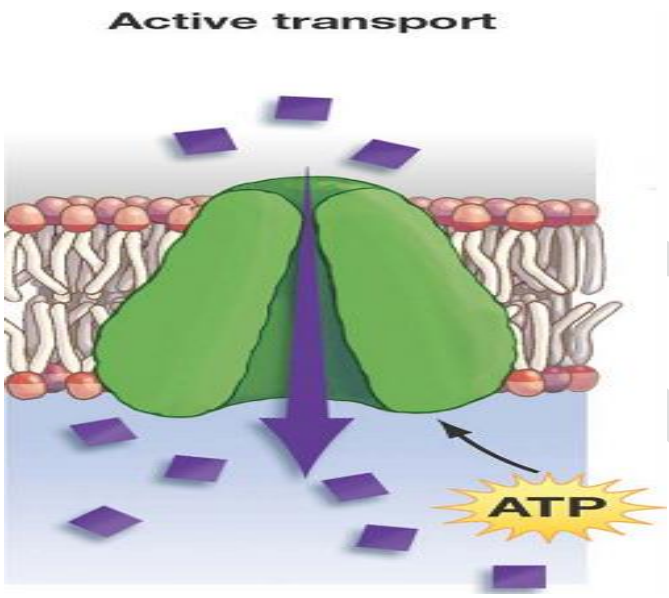
6) (سؤال من اختبار سابق)Which of the following require ATP……

a) passive transport

b) active transport

c) diffusion

d) a & c



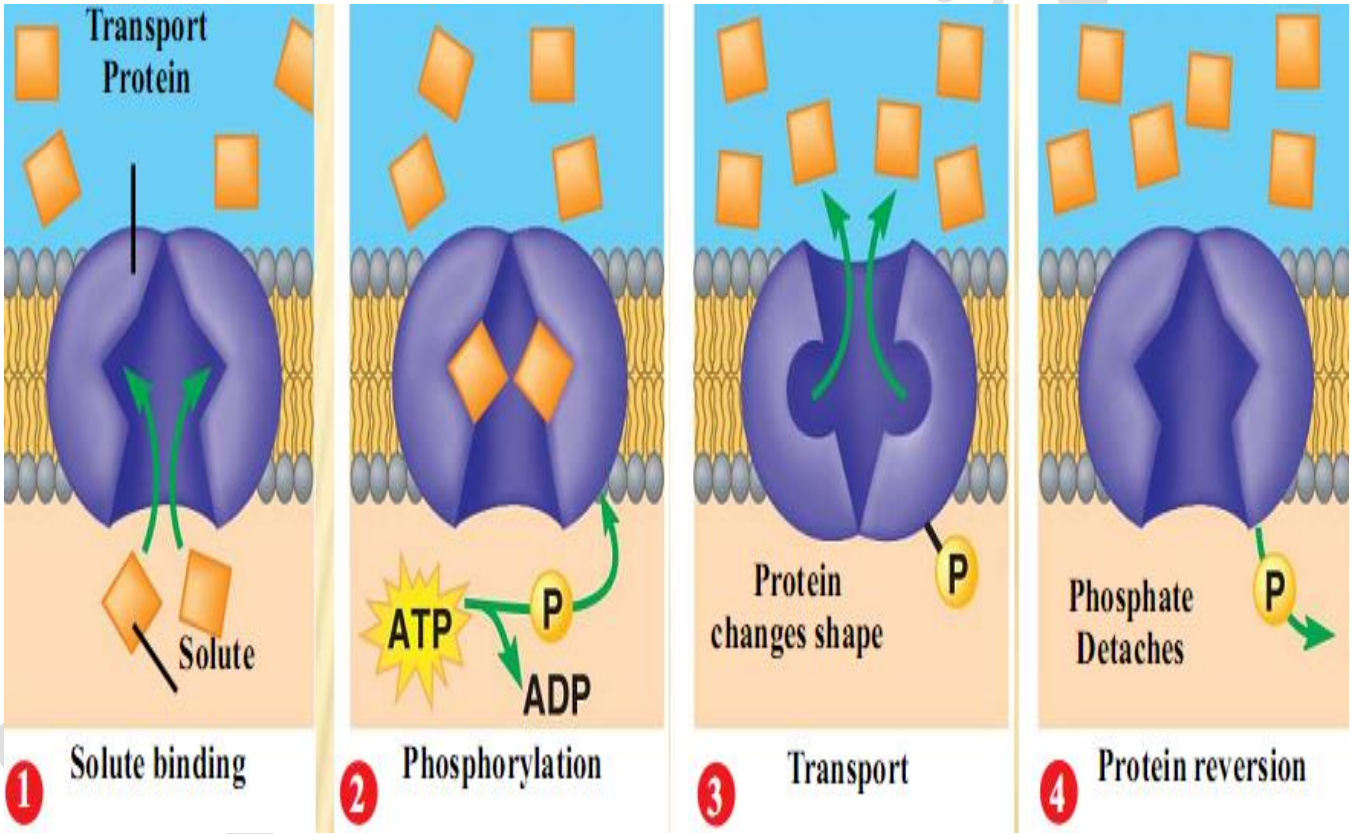
- Molecules again move through a transport protein, but now energy must be expended to move them against their concentration gradient .

To understand the active transport we will show a simple model of moving a solute out of the cell against its concentration gradient;

1) First, a solute on the plasmic side of the plasma membrane attaches to a specific binding site on the transport protein.
2) ATP then transfer one of its phosphate groups to the transport protein
3) Causing it to change shape
4) Then the phosphate group detaches, and the transport protein returns to its original shape, ready for new round of active transport.

7) (سؤال من اختبار سابق)the transfering phosphate group from ATP molecule cause…..

a) Catching the energy
b) Changing in the transport protein structure
c) Both
d) None of the above



Active transport of a solute across a membrane

Chapter 6

6.1.8 - Osmosis is the diffusion of water across a membrane

Osmosis

The diffusion of water molecules across a selectively permeable membrane down its concentration gradient تدرج التركيز until the concentration of solute is equal on both sides of membrane (equilibrium)

(Higher concentration of water to lower concentration of water)

1.(سؤال من اختبار سابق) Diffusion of water across a membrane is known as _____ .

a) Osmosis
b) Exocytosis
c) Phagocytosis
d) none of the above

Water

Water is one of the most important substances that cross membrane by passive transport.

2. (سؤال من اختبار سابق)Water transport through the membrane done by .....

a) Active transport
b) Passive transport
c) Exocytosis transport
d) Endocytosis transport

A selectively permeable membrane

Is a membrane that allows some substances to cross more easily than others.

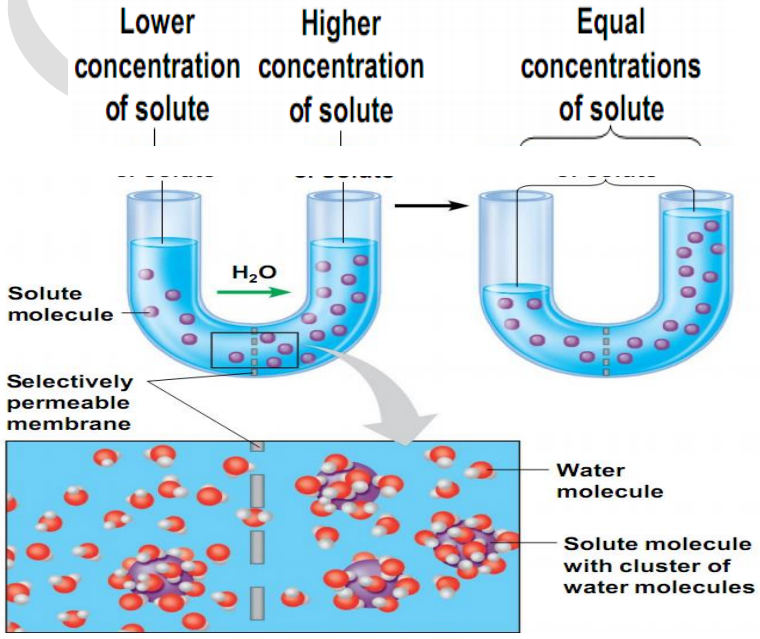
3. (سؤال من اختبار سابق) A membrane that allows some substances to cross more easily than others___.

a) Semi permeable membrane
b) Permeable membrane
c) Selectively permeable membrane
d) Non permeable membrane

Solute

A substance that dissolves in a liquid solvent, producing a solution

- ✓ **If a membrane permeable to water but not to a solute (such as glucose) separates two Solutions with different concentrations of solute.**
- ✓ **The solution on the right side has a higher concentration of solute than on the left side ,water cross the membrane until the concentration equals on both sides .**



4. (سؤال من اختبار سابق)In osmosis the water moves from .....

a) Higher concentration of water to lower concentration of water
b) Lower concentration of water to higher concentration of water
c) Moves in the both directions
d) None of the above

5. (سؤال من اختبار سابق)In osmosis the water moves from.....

a) Higher concentration of solute to lower concentration of solute
b) Lower concentration of solute to higher concentration of solute
c) Moves in the both directions
d) None of the above

6. (سؤال من اختبار سابق)A substance that dissolves in a liquid solvent, producing a solution is.....

a) Solvent
b) Solution
c) Solute
d) A & B

7.(سؤال من اختبار سابق) In osmosis the water moves from .....

a) Higher concentration of water and solute
b) Lower concentration of water and solute
c) Higher concentration of solute and lower concentration of water
d) Higher concentration of water and lower concentration of solute

8. (سؤال من اختبار سابق)In osmosis the water moves to .....

a) Higher concentration of water and solute
b) Lower concentration of water and solute
c) Higher concentration of solute and lower concentration of water
d) Higher concentration of water and lower concentration of solute

- ✓ **Polar water molecules form weak bonds with solute molecules ,so that fewer water are free to diffuse across the membrane .**
- ✓ **The less concentrated solution with fewer solute molecules has more free water to diffuse so the water moves down its concentration gradient from the lower concentration Of solute to the higher concentration of solute .**

Note

The direction of osmosis is determined by the difference in total solute concentration Not by the nature of the solute .

9. (سؤال من اختبار سابق)The direction of osmosis depends on .....

a) the nature of the solute
b) the difference in total solute concentration
c) Both a & b
d) None of the above

10. (سؤال من اختبار سابق)Water molecules with .....are free to diffuse more easily.

a) Higher solute concentration
b) lower solute concentration
c) Any concentration
d) A & B

Chapter 6

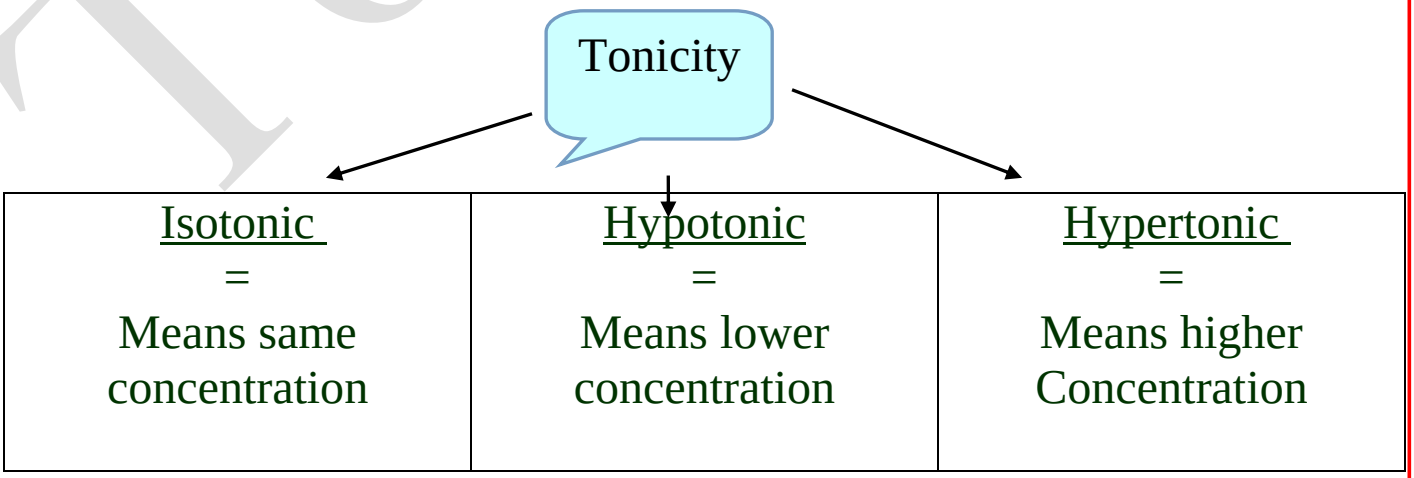
6.1.9 water balance between cells and their surroundings

Is crucial to organism

tonicity

The ability of solution to cause a cell to gain or lose water ,it depends on its concentration of non-penetrating solutes that Can not cross the plasma membrane on both sides relative to the concentrations of solutes حسب التركيز in the cell .

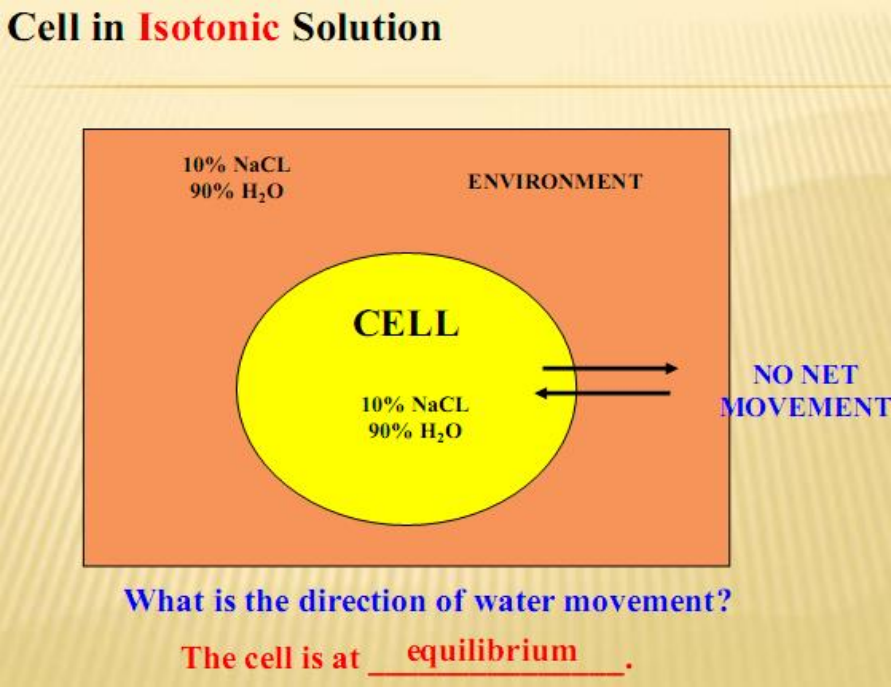
1. (سؤال من اختبار سابق)The ability of solution to cause a cell to gain or lose water ,it depends on its concentration of solutes …….
   a) Tonicity
   b) Osmoregulation
   c) Plasmolysis
   d) None of the above



Isotope solution

- Solution with concentration equal to the solute concentration of the cell .
- The cell's volume remains constant.
- The cell gains water at the same rate that it loses it .

- The cells of most animals present in an extra-cellular fluid that Is isotonic to the cells .
- Blood and intravenous fluids are preserved in solutions isotonic to the blood cells in hospitals.



2. (سؤال من اختبار سابق)Isotonic _____

- Indicates that the concentration of a solute is the same on both sides
- indicates that the concentration of solute is higher outside the cell
- is not related to solute concentration
- all of the above

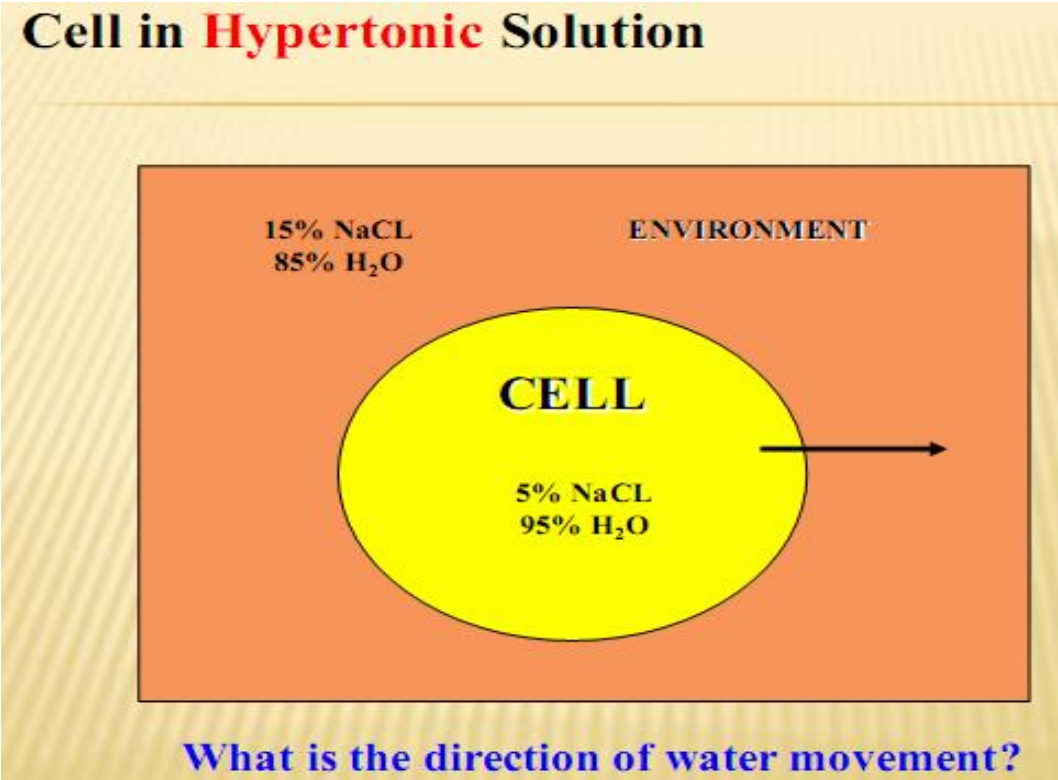
3 . (سؤال من اختبار سابق)Blood and intravenous fluids are preserved in solutions ..... to the blood cells in hospitals

a) Isotonic
b) Hypotonic
c) Hypertonic
d) None of the above

Hypertonic solution

- A solution with a higher solute concentration of the cell.
- The cell shrivels (shrinks) and can die from water lose.

Water moves from the cell to the outer environment because the concentration of solutes in outside the cell is higher than inside the cell.



4. (سؤال من اختبار سابق)_____ indicates that the concentration of solute is higher outside the cell

- Hypertonic
- Isotonic
- Hypertension
- all of the above

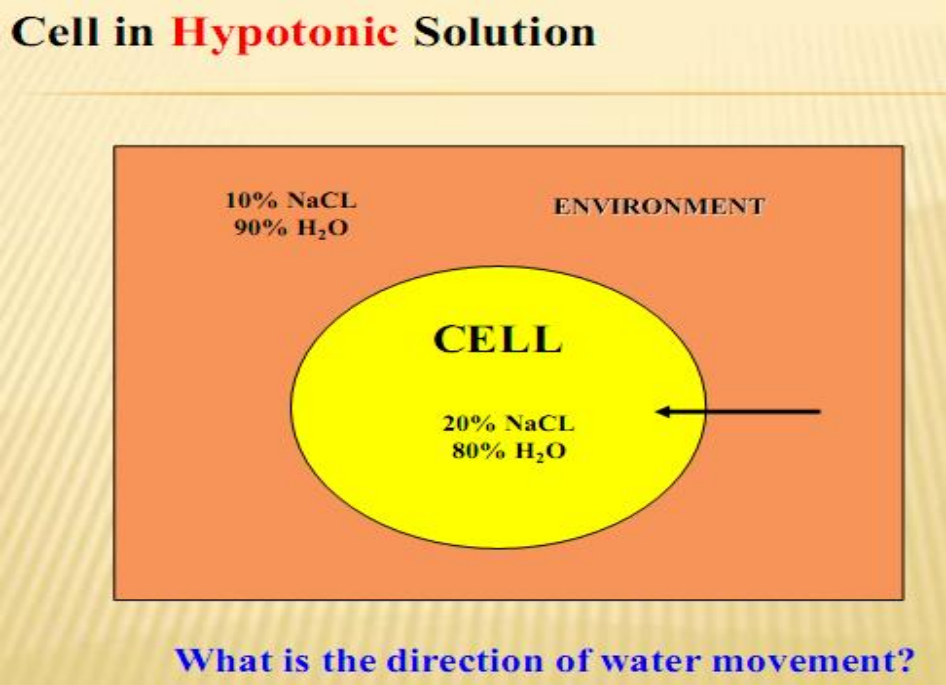
5. (سؤال من اختبار سابق)Hypertonic _____

- indicates that the concentration of solute is higher outside the cell
- indicates that the concentration of a solute is the same on both sides
- indicates a higher concentration of solute inside the cell
- none of the above

Hypotonic solution

- A solution with a solute concentration lower than that of cell .
- The cell gains water ,then swells ,and become like an over filled ballon (lyse).

Water moves from the environment to the cell because the concentration inside the cell is higher than outside the cell.

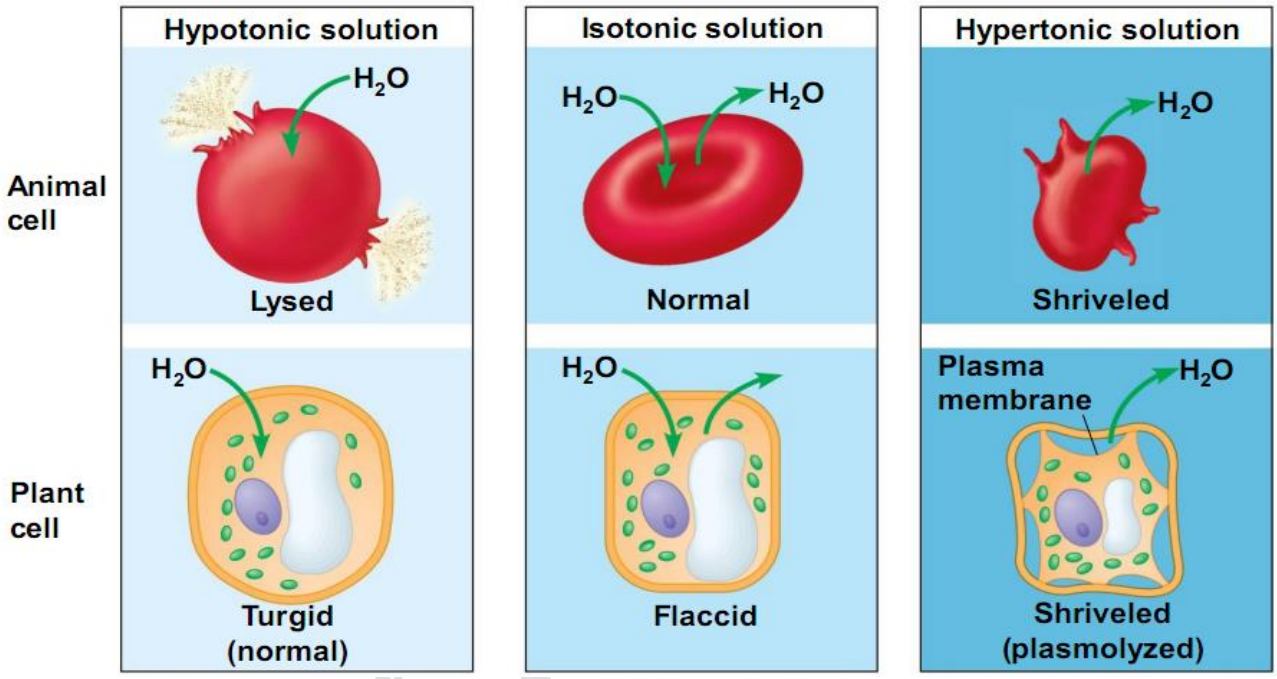


6.(سؤال من اختبار سابق) _____ indicates a higher concentration of solute inside the cell

- Hypotonic
- Hypertonic
- Isotonic
- First and second choice

7. (سؤال من اختبار سابق)Hypotonic _____

- indicates a higher concentration of solute inside the cell
- indicates that the concentration of a solute is the same on both sides
- indicates that the concentration of solute is higher outside the cell
- First and second choice



How the animal & plant cells behave in different solutions

In isotonic solution

Plant cell → flaccid (limp)

Animal cell → normal shape & volume

8.(سؤال من اختبار سابق) in isotonic solution the plant cell get …….

a) Shriveled

b) Flaccid

c) Turgid

d) None of the above

9. (سؤال من اختبار سابق)in isotonic solution the animal cell is ……

a) Lysed

b) Shriveled

c) Normal

d) None of the above

Hypotonic solution

Plant cell → become turgid (healthy state) as the plant cell Needs a net inflow of water ,the pressure of this water uptake prevents the cell from taking too much water and bursting .(plants have elastic cell wall).

-Plants depend on turgid cells for mechanical support.

Animal cell → taking in too much water and bursting (lysed)

10. (سؤال من اختبار سابق)Placing Red Blood Cell in distilled water will cause the cell to _____

- burst
- does not change
- Flaccid
- First and second choice

11. (سؤال من اختبار سابق)Placing Red Blood Cell in distilled water will cause the cell to ____

- Lysed
- shrink
- does not change
- First and second choice

12.(سؤال من اختبار سابق) in hypotonic solution the plant cell get …….

a) Shriveled
b) Flaccid
c) Turgid
d) None of the above

13. (سؤال من اختبار سابق)in hypotonic solution the animal cell get ……

a) Normal
b) Shriveled
c) Lysed
d) None of the above

Hypertonic solution

Plant cell → loses water and shrivels ,its plasma membrane pulls away from the cell wall in process called **plasmolysis.**

animal cell → also loses water and shrivels .

14.(سؤال من اختبار سابق) Placing Red Blood Cell in sea water will cause the cell to _____

- Shriveled
- Lysed
- burst
- all of the above

15.(سؤال من اختبار سابق) in hypertonic solution the plant cell get …….

a) Flaccid
b) Turgid
c) Plasmolysed (shriveled)
d) None of the above

16. (سؤال من اختبار سابق)in hypertonic solution the animal cell get ……

a) Normal
b) Shriveled
c) Lysed
d) None of the above

Chapter 6

6.1.10 Exocytosis and endocytosis transport large molecules across membranes

1) (سؤال من اختبار سابق)transport large molecules across membranes occur by .....

a) Diffusion
b) Passive transport
c) Exocytosis and endocytosis
d) None of the above

A cell uses two mechanisms for moving large molecules across membranes

Exocytosis

- is used to export bulky molecules, such as proteins or polysaccharides

Endocytosis

- is used to import substances useful to the livelihood of the cell

2) (سؤال من اختبار سابق)Export bulky molecules, such as proteins or polysaccharides called……..

a) endocytosis
b) Exocytosis
c) Diffusion
d) Passive transport

3) (سؤال من اختبار سابق)import substances useful to the livelihood of the cell called……

a) endocytosis
b) Exocytosis
c) Diffusion
d) Passive transport

4) (سؤال من اختبار سابق)A cell uses ……..mechanisms for moving large molecules across membranes

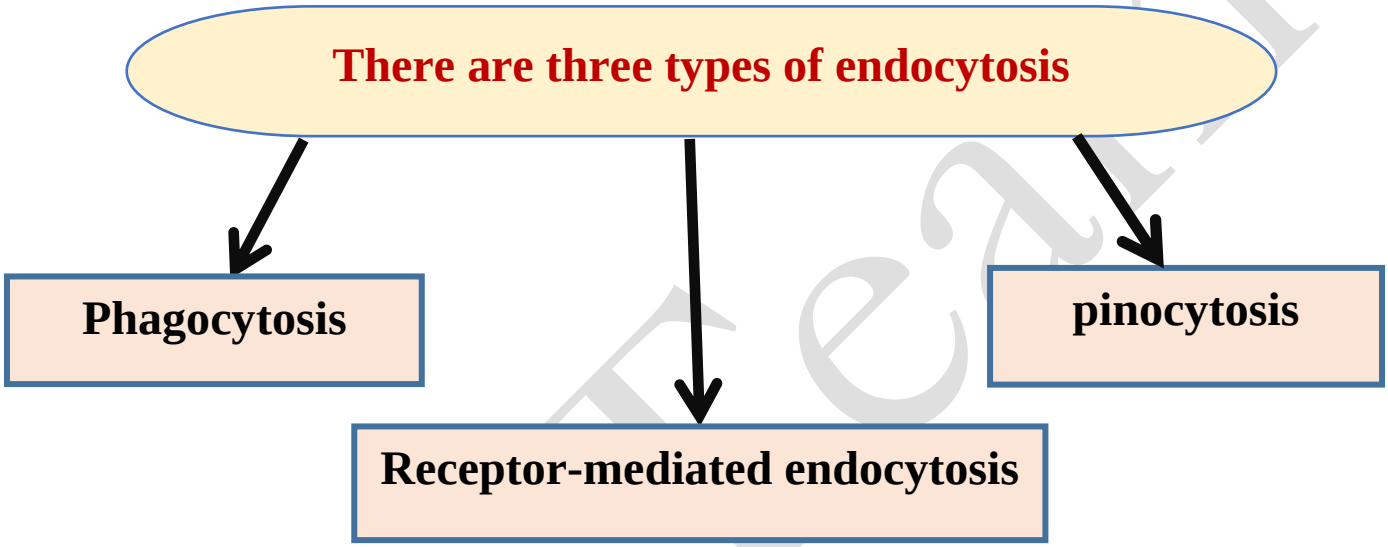
a) Three
b) Four
c) Two
d) One

5) (سؤال من اختبار سابق)the large molecules like food particles across membranes by …….

a) Exocytosis
b) Endocytosis
c) Diffusion
d) a & b

6) (سؤال من اختبار سابق)Food or other particles transported by …….

a) Exocytosis
b) Endocytosis
c) Diffusion
d) a & b



7)(سؤال من اختبار سابق) There are ….. types of endocytosis

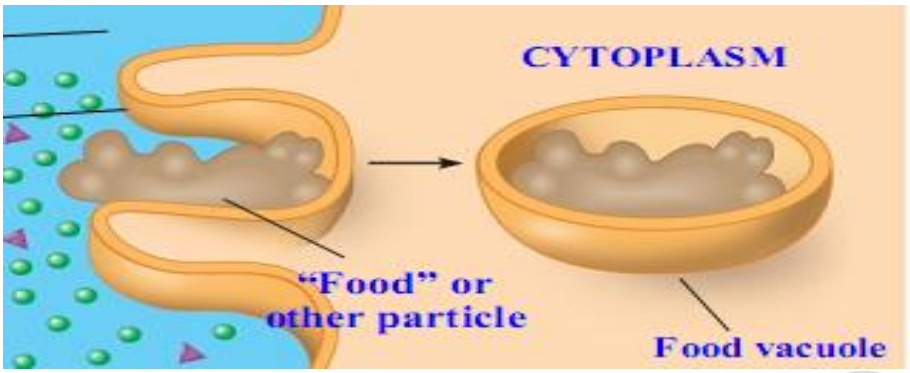
a) Two
b) Three
c) Four
d) Five

8) (سؤال من اختبار سابق) …….is a type of endocytosis

a) pinocytosis
b) Phagocytosis
c) Receptor-mediated endocytosis
d) All of the above

Phagocytosis

Phagocytosis is the engulfment of a particle by wrapping cell membrane around it, forming a vacuole

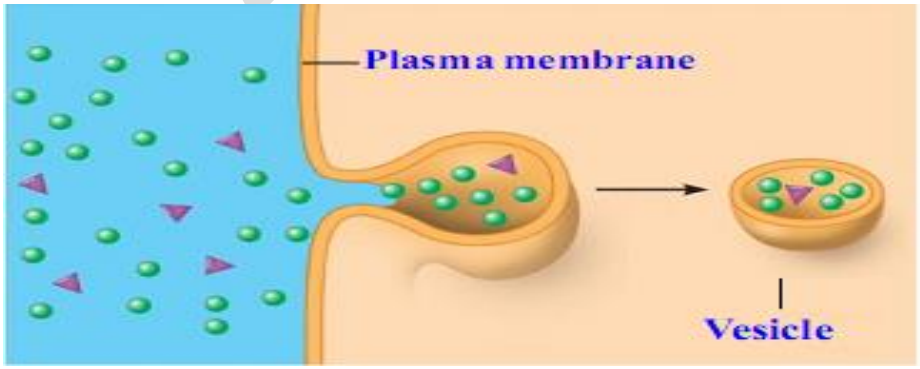


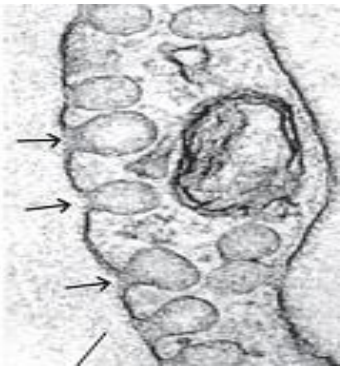
9) (سؤال من اختبار سابق)the engulfment of a particle by wrapping cell membrane around it, forming a vacuole is called …….

a) pinocytosis
b) Exocytosis
c) Phagocytosis
d) Diffusion

Pinocytosis

is the same thing except that fluids are taken into small vesicles





10)(سؤال من اختبار سابق) the engulfment of a fluids are taken into small vesicles is called ……

a) Pinocytosis

b) Phagocytosis

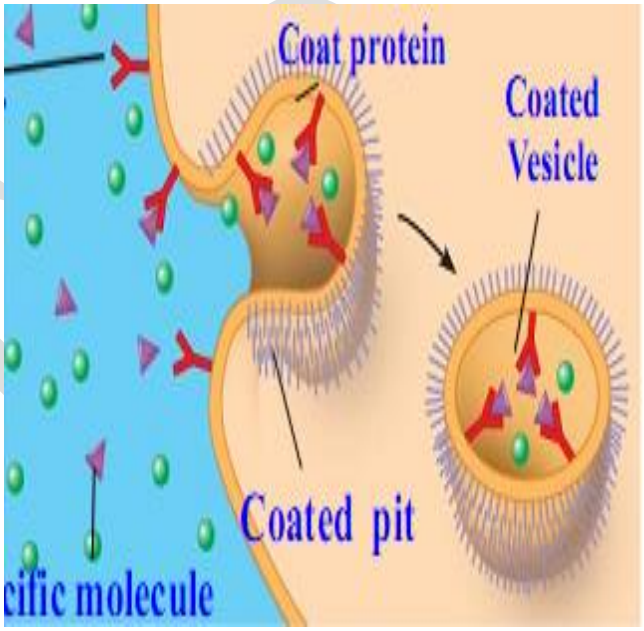
c) Exocytosis

d) Receptor-mediated endocytosis

Receptor-mediated endocytosis

is where receptors in a receptor-coated pit interact with a specific protein, initiating formation of a vesicle

receptor



Specific molecule

11) (سؤال من اختبار سابق)where receptors in a receptor-coated pit interact with a specific protein, initiating formation of a vesicle is called……..

a) Pinocytosis

b) Phagocytosis

c) Exocytosis

d) Receptor-mediated endocytosis