



PAST PAPERS



BIOLOGY

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Chapter(3):The chemistry of water

- 1) The specific heat of water is :
 - A.5 Cal per g per C
 - B.2 Cal per g per C
 - C.3 Cal per g per C
 - D.1 Cal per g per C

- 2) The specific heat of water is
 - A.High
 - B.Low
 - C.Moderate
 - D.None of above

- 3) The sphere of water molecule around an ions is known as
 - A.Hydration shell
 - B.Cohesion
 - C.Adhesion
 - D.Surface tension

- 4) Each water molecules can form hydrogen bond with other ———molecules
 - A.4
 - B.3
 - C.2
 - D.1

- 5) Ice floats above liquid water because
 - A.Ice is less dense than water
 - B.Liquid water is less dense than water
 - C.Both of liquid water and ice have same density
 - D.A+C
 - E.None of the above

- 6) some evaporation can occur at———
 - A.High temperature
 - B.Low temperature
 - C.Any temperature
 - D.At 100C
 - E.None of the above

7) Describe water's heat of vaporization

- A.High
- B.Low
- C.Moderate
- D.It has none
- E.All of the above

8) when water vaporizes , which of the following bonds must be broken

- A.Ionic
- B.Polar covalent
- C.Hydrogen bond
- D.Hydrophobic
- E.None of the above

9) which the following is not property of liquid water

- A.Ice has a lower density than liquid water
- B.Liquid water has high surface tension
- C.Can form hydrogen bond with other water molecules
- D.Has low specific heat
- E.None of the above

10) Most important reason for unusual properties of water is

- A.The covalent bonding pattern-in water molecules
- B.The bond angle between two hydrogen atoms in the molecule
- C.Hydrogen bonding between water molecules
- D.None of the above
- E.All of the above

11) The property that can make water resistant to changing in its temperature

- A.High surface tension
- B.High specific heat
- C.High heat of evaporation
- D.Its V shape
- E.Covalent bond between water molecules

12) In aqueous solution , the solvent is ---

- A.Water chloroform

- B. Ether
- C. All of the above
- D. None of the above

13) which of the following classified as hydrophilic molecules but cannot dissolve in water

- A. Cellulose
- B. Cotton
- C. Oil
- D. Salt
- E. A+ B

14) Which of the following helps in the transporting of water against gravity

- A. Cohesion
- B. Adhesion
- C. Evaporation
- D. Condensation
- E. All of them except D

15) Hydration shell can be form around

- A. Ion
- B. Sugar
- C. Oil
- D. Glucose
- E. All of them except C

16) which of the following is true about electronegativity of oxygen and hydrogen

- A. Hydrogen is more electronegative than oxygen
- B. Oxygen is more electronegative than hydrogen
- C. Oxygen and hydrogen have the same electro negativity

17) which the following is hydrophobic material

- A. Paper
- B. Salt
- C. Wax
- D. Sugar
- E. Pasta

18) Transformation of material from liquid to gaseous state is known as

- A. Evaporation
- B. Vaporization

- C.Boiling
- D.Condensation
- E.A+B

19) The tendency of water molecules to stay close to each other as a result of hydrogen bonding

- A.Acts to moderate temperature
- B.Keeps water moving through the vessels in tree trunk
- C.Is called cohesion
- D.Provide the surface tension that allows leaves to float on water
- E.All of the listed responses are correct

20) The oxygen atom in a water molecule due to its high electronegativity

- A.One negative charge
- B.Two negative charges
- C.One positive charge
- D.Two positive charges
- E.None of the above

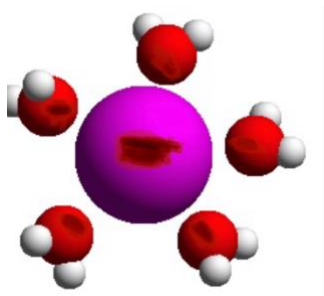
21) Hydrogen bond is
Attraction between hydrogen and electronegative atom

22) What is specific heat

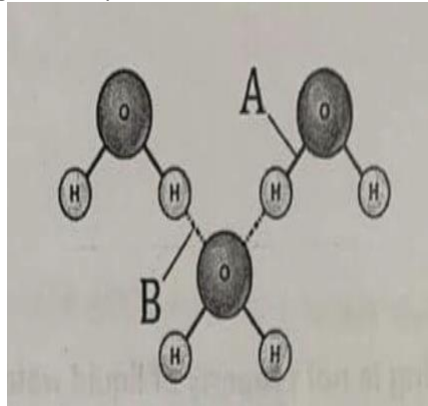
- A.The temperature it takes to raise 1g of a substance by 1 degree C
- B.The temperature it takes to raise 1g of a substance by 1 degree F
- C.The temperature in Celsius to boil 1g of substance at boiling point

23) Based on your knowledge of the polarity of water molecules, the solute molecules depicted here is most likely.

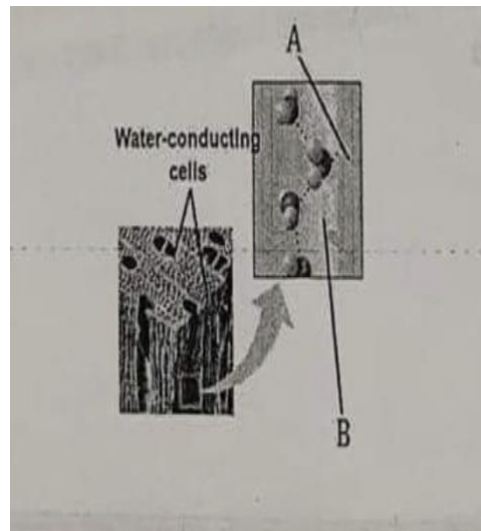
- A.Positively charged
- B.Negatively charged
- C.Whiteout charged
- D.None polar



24) According to the figure A represent ——— bond while B represent ——— bond



25) According to the figure which letters represent adhesion and which represent cohesion?



26) When water vaporizes, which of the following bonds is broken

- A. Ionic
- B. Hydrogen
- C. Polar covalent
- D. Non polar covalent

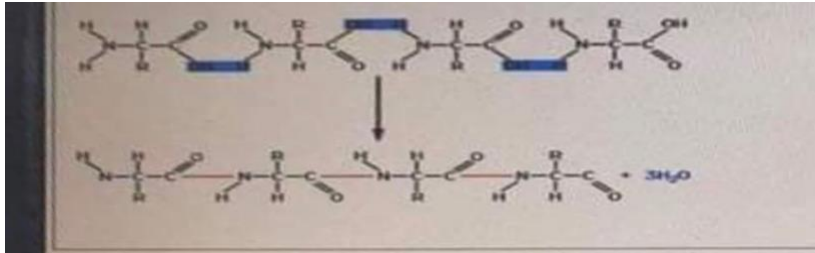
Answers

1. D) 1 cal per g per C
2. A)High
3. A)Hydration shell
4. A)4
5. A)Ice is less dense than water
6. C)At any temperature
7. A)High
8. C)Hydrogen bond
9. D)Has low specific heat
10. C)Hydrogen bonding between water molecules
11. B)High specific heat
12. A)Water
13. E)B+ A
14. E)All of them except D
15. E)All of them except C
16. B)Oxygen is more electronegative than hydrogen
17. C)Wax
18. E)A+B
19. E)All of the listed responses are correct
20. B)Two negative charges
21. Answered
22. A.The temperature it takes to raise 1g of a substance by 1 degree C
23. Positively charged
24. A)polar. B)hydrogen bond
25. A) Adhesion. B)Cohesion
26. B)Hydrogen bonds **

"نشق الدروب إليك يا رب، موقنين أنها خضراء نضرة، راجيين أن تحصد أقدامنا حبك وقبولك، آمليين.
ألا يمسننا نصب ولا نقل عزيمتنا "

Chapter (5): Biological macromolecules

1. What are formed in the reaction shown



- A. Ester bond
- B. Peptide bond
- C. hydrogen bond
- D. ionic bond

2. Sulfur can be found in:

- A. Proteins
- B. Starch
- C. DNA
- D. Cholesterols
- E. Fats

3. All of the following considered as lipids except of

- A. Fats
- B. Phospholipids
- C. Some waxes
- D. Cholesterols
- E. All of them are lipids

4. The sugar that have nitrogen containing appendage in their monomer

- A. Cellulose
- B. Starch
- C. Glycogen
- D. Chitin

5. Insoluble fibers is

- A. Carbs
- B. Cellulose
- C. Starch
- D. Glycogen
- E. A + B

6. Disulfide bridge can stabilize _____ structure of protein

- A. Primary
- B. Secondary
- C. Tertiary
- D. Quaternary
- E. All of the above

7. Which of the following doesn't contain amino acids

- A. Hemoglobin
- B. Collagens
- C. Enzymes
- D. RNA
- E. Insulin

8. Which of the following doesn't contain true polymer?

- A. Protein
- B. Carbs
- C. Lipids
- D. DNA
- E. RNA

9. Lipids are a group of molecules that _____

- A. Contain peptide bonds
- B. Mix poorly with water
- C. Contain polar parts
- D. All of the above
- E. A + B

10. How many water molecules needed to hydrolyze a polymer made of 4 monomers

- A. 4
- B. 3
- C. 2
- D. 1

11. In order to synthesize one fat molecule, the dehydration reaction needs remove _____ water molecules

- A. 3
- B. 4
- C. 5
- D. 6

12. Secondary structure of protein form by hydrogen bonding between _____

- A. Backbone
- B. Side chain
- C. R group
- D. Amino groups
- E. None of the above

13. Which of the following is "Storage carbs in plant

- A. Starch
- B. Cellulose
- C. Glycogen
- D. Chitin
- E. Insulin

14. Enzymes are usually _____

- A. Carbs
- B. Fats
- C. Nucleic acid
- D. Monosaccharides
- E. Protein

15. Animals store glucose in the form of which macromolecule

- A. Amylose
- B. Glycogen
- C. Glycerol
- D. Cellulose

16. Which of the following is true about globular proteins

- A. It's hydrophilic amino acids can be found at the surface
- B. It's hydrophilic amino acids can be found in the core
- C. It's hydrophobic amino acid can be found at the surface
- D. It's hydrophobic amino acid can be found in the core
- E. A + D

17. Which of the following is mismatched

- A. Polypeptide =peptide bond
- B. Fats= ester bond
- C. Carbs= glycosidic linkage
- D. All of them are correct

18. Which of the following is true about DNA

- A. It's 5 end contains OH
- B. It's 3 end contains phosphate group
- C. It contains ribose sugar in its nucleotide
- D. It is found as a double helix molecule

19. The minimum number of carbons in monosaccharide is

- A. 4
- B. 5
- C. 3
- D. 2
- E. 1

20. In the formation of macromolecule what type of reaction would join two subunits together

- A. Hydrophobic reaction
- B. Hydrolysis reaction
- C. Dehydration reaction
- D. Denaturation reaction

21. Assuming that all of the below given compound had the same number of carbon atoms, which of the following has the most C-H bonds

- A. Unsaturated fat
- B. Poly saturated fat
- C. Polysaccharides
- D. Saturated fats

22. The different chemical and physical properties of amino acid depends on

- A. Carboxyl group
- B. Amino group
- C. Side chain
- D. Alpha Carbon

23. Aldose sugars and ketose sugars differ in

- A. Position of carbonyl group
- B. Number of carbonyl groups
- C. Position of carboxyl group
- D. Number of carboxyl groups

24. Cholesterol is a

- A. Triglyceride
- B. Phospholipid
- C. Steroid
- D. Proteins
- E. All of the above

25. Which of the following isn't a disaccharide

- A. Sucrose
- B. Maltose
- C. Lactose
- D. Amylose

26. Which of the following is hydrophobic

- A. Cellulose
- B. Starch
- C. Animal fats
- D. Oils
- E. C + D

27. Which the following is true about saturated fats?

- A. It contains unsaturated fatty acid with double bond
- B. It contains saturated fatty acid with no kinks
- C. It is solid at room temperature
- E. All of them are correct except A

28. Oils are liquid at room temperature because they

- A. Are small molecules
- B. Are nonpolar
- C. Are hydrophobic
- D. Contains unsaturated fatty acid
- E. Contains saturated fatty acid

29. Which of the following is true :

- A. Amylose is branched molecule
- B. Amylopectin is unbranched molecule
- C. Starch contains alpha glucose in its monomer
- D. Human can digest starch
- E. Both C and D are correct

30. Misfolded protein involved in:

- A. Mad cow disease
- B. Parkinson's disease
- C. Cystic fibrosis
- D. Alzheimer's
- E. All of the above

31. which of the following found only in RNA:

- A. Ribose sugar and adenine
- B. Deoxyribose sugar and uracil
- C. Ribose sugar and uracil
- D. Ribose sugar and guanine
- E. Any of the above

32. Large organic molecules are usually assembled by polymerization of few kinds of simple subunits. Which of the following is exception to this statement ?

- A. A steroid
- B. Cellulose
- C. DNA
- D. An enzyme
- E. A contractile protein

33. The bonding of two amino acid molecules to form larger molecule requires:

- A. The release of water molecule
- B. The release carbon dioxide molecule
- C. The addition of nitrogen atom
- D. The addition of water molecule
- E. The release of nitrogen dioxide molecule

34. Which of the following is false about cellulose?

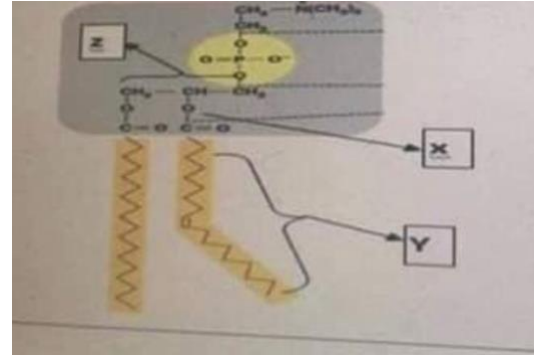
- A. It made of B-glucose
- B. It is the main component of plant cell wall
- C. Can form hydrogen bond with other parallel cellulose molecules
- D. it cannot be digested by human enzymes
- E. All of them are true

35. Which of the following not polymer

- A. Steroid
- B. Starch
- C. Cellulose
- D. Chitin

36. The bond at (X) is described as _____ bond

- A. Glycosidic
- B. Ester
- C. Peptide
- D. Ionic



37. Which of the following nitrogenous bases is purine

- A. C and G
- B. A and G
- C. U and T

38. What type of macromolecule carries out catalysis in biological systems

- A. Protein called enzymes
- B. Carbs called starches
- C. Lipids called steroids

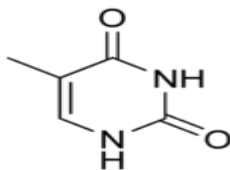
39. What are the most diverse macromolecule in the cell

- A. Lipid
- B. Mineral salts
- C. Proteins
- D. Carbs

40. In a sucrose molecule, the linkage between glucose and fructose is:

- A. 1-4 glycosidic
- B. 1-2 glycosidic
- C. 1-6 glycosidic
- D. Peptide
- E. Ester

41. The figure represents



- A. Purine
- B. Pyrimidine
- C. Sugar
- D. Fat

42. Molecule with which functional group may form polymers via dehydration reactions ?

- A. hydroxyl group
- B. carbonyl group
- C. Carboxyl group
- D. Either carbonyl or carboxyl group
- E. Either carboxyl or hydroxyl group

43. Which of these molecules is not formed by dehydration reaction ?

- A. Fatty acid
- B. Disaccharide
- C. DNA
- D. Protein
- E. Amylose

44. Which of these classes of biological molecule consist of both small molecules and macromolecules polymers ?

- A. Lipids
- B. Carbohydrates
- C. Protein
- D. Nucleic acid
- E. Lipids, carbohydrates, protein and nucleic acid all consist of only macromolecular polymer

45. Which of the following is not a polymer ?

- A. Glucose
- B. Starch
- C. Cellulose
- D. Chitin
- E. DNA

46. Which of the following is true about sickle cell anemia?

- A. It is caused by point mutation that lead to substitution of one amino acid
- B. It is involved abnormal alpha subunit
- C. Hemoglobin molecules aggregate in a long fiber
- D. Reduced capacity for oxygen transport
- E. All of them are true except of (B)

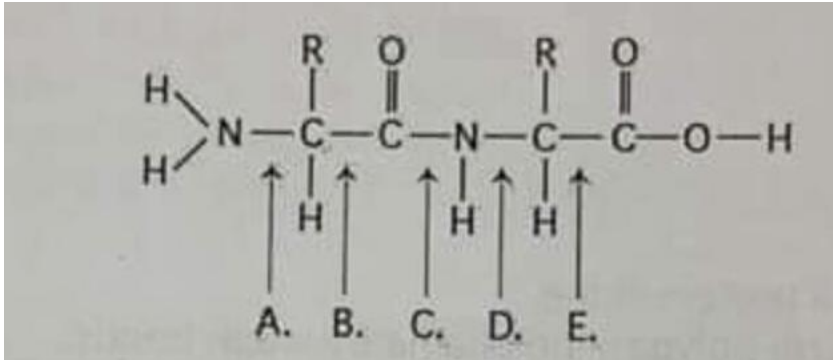
47. Which of the following categories includes all other in the list?

- A. Disaccharide
- B. Polysaccharide
- C. Starch
- D. Carbohydrate

48. Which is the chemical reaction mechanism by which cells make polymer from monomers ?

- A. Phosphodiester linkages
- B. Hydrolysis
- C. Dehydration reaction
- D. Ionic bonding of monomers
- E. The formation of disulfide bridges between monomers

49. According to the figure



A) Which bond is peptide bond?

- A. A
- B. B
- C. C
- D. D
- E. E

B) Which bond is closest to the amino terminus of the molecule?

- A. A
- B. B
- C. C
- D. D
- E. E

C) At which bond water needed to be added to achieve hydrolysis of the peptide

- A. A
- B. B
- C. C
- D. D
- E. E

50. How many molecules of water are needed to completely hydrolyze a polymer that is 11 monomers long?

- A. 12
- B. 11
- C. 10
- D. 9
- E. 8

51. Which of the following is best summarizes the relationship between dehydration reaction and hydrolysis ?

- A. Dehydration reaction assemble polymers, and hydrolysis reaction break down polymers
- B. Dehydration reaction eliminate water from lipid membranes, and hydrolysis make lipid membranes water permeable
- C. Dehydration reaction can occur only after hydrolysis
- D. Hydrolysis creates monomers, and dehydration reaction break down polymers
- E. Dehydration reaction ionize water molecules and add hydroxyl group to polymers; hydrolysis reaction release hydroxyl group from polymers

52. Lactose, a sugar in milk, is composed of one glucose molecule joined by a glycosidic linkage to one galactose molecule. How is lactose classified?

- A. As a pentose
- B. As a hexose
- C. as a monosaccharide
- D. As a disaccharide
- E. As a polysaccharide

53. Human sex hormone can be classified as

- A. Protein
- B. Lipid
- C. Steroids
- D. B+C
- E. A+ B

54. The simplest amino acid is

- A. Glycine
- B. Serine
- C. Valine
- D. Lysine

55. which of the following is true of both starch and cellulose ?
- A. They are both polymers of glucose
 - B. They are cis-trans isomers of each other
 - C. They can both be digested by humans
 - D. They are both used for energy storage in plants
 - E. They are both structural components of the plant cell wall
56. which of the following statements is true for the class of biological molecules known as lipids?
- A. They are insoluble in water
 - B. They are made from glycerol, fatty acid, phosphate
 - C. They contain less energy than proteins and carbohydrates
 - D. They are made by dehydration reaction
 - E. They contain nitrogen
57. when protein lose its native shape it called:
- A. Denaturation
 - B. Renaturation
 - C. Destruction
 - D. Deformation
 - E. None of the above
58. Phospholipids contain :
- A. Glycerol
 - B. 2 hydrocarbon tails
 - C. Phosphate group
 - D. Amino group
 - E. All of them except of (D)
59. There are 20 different amino acids, what makes one amino acid different from another
- A. Different side chain (R group) attached to COOH group
 - B. Different side chain (R group) attached to amino groups
 - C. Different side chain (R group) attached to a carbon
 - D. Different asymmetric carbons
60. Upon chemical analysis, a particular polypeptide was found to contain 100 amino acids, how many peptide bonds are present in this protein
- A. 100
 - B. 101
 - C. 99
 - D. 98
 - E. 97

61. If a DNA sample were composed of 10% thymine, what would be the percentage of guanine

- A. 10
- B. 20
- C. 40
- D. 80

62. which of the following polymers contain nitrogen ?

- A. Starch
- B. Glycogen
- C. Cellulose
- D. Chitin
- E. Amylopectin

63. a molecule with the chemical formula $C_6H_{12}O_6$ is probably a:

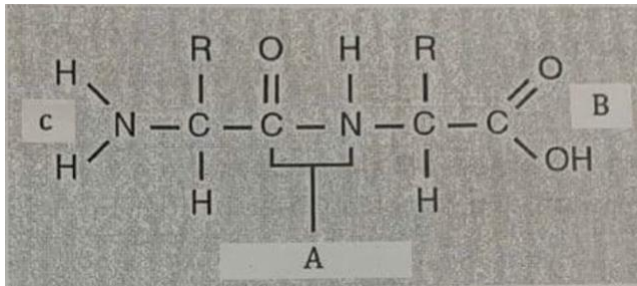
- A. Carbohydrate
- B. Lipid
- C. Monosaccharide
- D. Carbohydrate and lipid only
- E. Carbohydrate and monosaccharide only

64. The molecular formula for glucose is $C_6H_{12}O_6$. What would be the molecular formula for a polymer made by linking 10 glucose by dehydration reaction (CHO)

- A. (60 120 60)
- B. (6 12 6)
- C. (60 102 51)
- D. (60 100 50)

بنضرب صيغة الجلوكوز ب ١٠ بعدها بنطرح ٩ جزيئات ماء

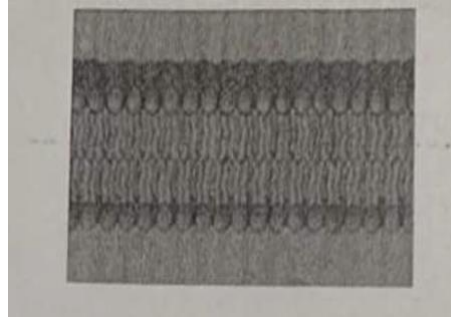
65.



- A: A represent ——— bond
- B: B represent ———
- C: C represent ———

66. The figure shows

- A. Phospholipid bilayer
- B. The structure of cell membrane
- C. Unsaturated fats
- D. Cholesterol
- E. A+B



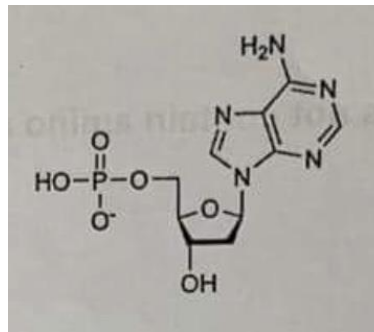
67. The figure shows



- A. RNA 3d shape
- B. Collagen
- C. Cellulose
- D. DNA

68. The figure represents

- A. Nucleotide
- B. Nucleoside mono phosphate
- C. Nucleoside diphosphate
- D. A+ B



69. Which of the following pairs of base form normal double helix of DNA

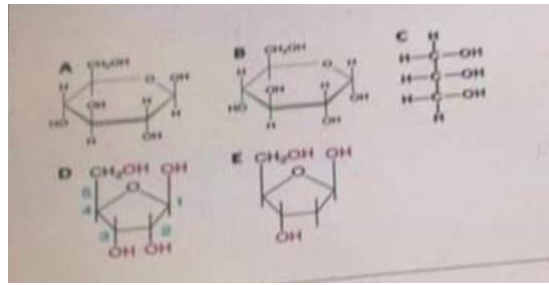
- A. 5'-AGCT-3' with 5'-TCGA-3'
- B. 5'-GCGC-3' with 5'-TATA-3'
- C. 5'-ATGC-3' with 5'-GCAT-3'
- D. All of the above are correct

70. The molecular formula for a polymer of 10 ribose molecules

- (C H O)
- A. 6 12. 6
 - B. 5 . 10. . 5
 - C. 60. 120. 60
 - D. 60. 102. 51
 - E. 50 92. 41

71. Which of the molecules shown in the figure is the monomer of cellulose

- A. A
- B. B
- C. C
- D. D
- E. E



72. The tertiary structure of protein is the
Unique 3d shape of the fully folded polypeptide

73. RNA molecules can find as a 3D shape due to :

- A. Hydrogen bonds between complementary base pairing

"ALL LIVES END. ALL HEARTS ARE BROKEN. CARING IS NOT AN ADVANTAGE." -"

Answers

1. B
2. A
3. E
4. D
5. B
6. C
7. D
8. C
9. B
10. B
11. A
12. A
13. A
14. E
15. B
16. E
17. D
18. D
19. C
20. C
21. D
22. C
23. A
24. C
25. D
26. E
27. E
28. D
29. E
30. E
31. C
32. A
33. A
34. E
35. A
36. B
37. B
38. A
39. C
40. B
41. B
42. E
43. A
44. B
45. A
46. E

- 47. D
- 48. C
- 49. A) C B) A C) C
- 50. C
- 51. A
- 52. D
- 53. D
- 54. A
- 55. A
- 56. A
- 57. A
- 58. E
- 59. C
- 60. C
- 61. C
- 62. D
- 63. E
- 64. C
- 65. A: Peptide bond
 B: C terminus
 C: N terminus
- 66. E
- 67. B
- 68. A
- 69. C
- 70. E
- 71. A

Chapter 7

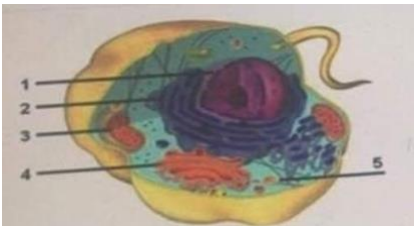
A) Which of the following pairs would be separated by different configurations?

- A) Ribosomes , Mitochondria
- B) Na^+ , K^+
- C) Cl^- , H_2PO_4^-
- D) Amino Acids , glucose
- E) None of the above

B) Viruses can be seen by

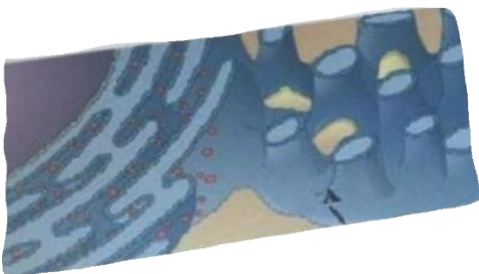
- A) Compound microscope
- B) Dissecting microscope
- C) Electron microscope
- D) Unaided eye
- E) A,B and C

C) Which organelle is responsible for the production of membrane proteins?



- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

D) Structure A in the picture functions in all of the following except



- A Carbohydrate metabolism
- B Steroids synthesis
- C Calcium storage

- D Drugs detoxification
- E Proteins sorting and packaging

E) The middle lamella that joins plant cells together is

- A) produced by the endoplasmic reticulum
- B) produced by the Golgi apparatus
- C) rich in sticky polysaccharides called pectins
- D) made of cellulose
- E) B&C are correct

F) Which of the following organelles are interconnected and made of membranous sacs called cisternae?

- A) Golgi apparatus
- B) Smooth endoplasmic reticulum
- C) Rough endoplasmic reticulum
- D) B&C
- E) All of the above

G) Large organisms do not generally have larger cells than small organisms, but simply have more cells, because

- A) Smaller cells have greater surface area to volume ratio
- B) Smaller cells have smaller surface area to volume ratio
- C) Diffusion cannot occur in large cells
- D) Large cells have fewer metabolic reactions
- E) Small cells move faster than large cells

1) Which of the following contain the 9 + 2 arrangement of microtubules?

- A) Cilia
- B) Centrioles
- C) Flagella
- D) A and C only
- E) A, B, and C

2) Which of the following possesses a micro tubular structure similar to a basal body?

- A) Centrioles
- B) Lysosome
- C) Nucleolus
- D) Peroxisomes
- E) Ribosome

3) Which statement correctly characterises bound ribosomes?

- A) Bound ribosomes are enclosed in their own membrane.
- B) Bound and free ribosomes are structurally different
- C) Bound ribosomes generally synthesise membrane proteins and secretory proteins.
- D) The most common location for bound ribosomes is the cytoplasmic surface of the plasma membrane.
- E) All of the above.

4) Tay-Sachs disease is a human genetic abnormality that results in cells accumulating and becoming clogged with very large and complex lipids.

Which cellular organelle must be involved in this condition

- A) The endoplasmic reticulum
- B) The Golgi apparatus
- C) Lysosomes
- D) Mitochondria
- E) membrane-bound ribosomes

5) Which is one of the main energy transformers of cells?

- A) Lysosome
- B) Vacuole
- C) Mitochondrion
- D) Golgi apparatus
- E) Peroxisomes

6) Which of the following contains its own DNA and ribosomes?

- A) Lysosome
- B) Vacuole
- C) Mitochondrion
- D) Golgi apparatus
- E) Peroxisomes

7) A cell has the following molecules and structures: enzymes, DNA, ribosomes, plasma membrane, and mitochondrion, it could be a cell from

- A) A bacterium.
- B) An animal, but not a plant.
- C) A plant, but not an animal.
- D) A plant or an animal.
- E) any kind of organism.

8) Cyanide binds with at least one molecule involved in producing ATP. If a cell is exposed to cyanide, most of the cyanide would be found within the

- A) mitochondria.
- B) Ribosomes.
- C) Peroxisomes.
- D) Lysosomes.
- E) Endoplasmic reticulum.

9) The liver is involved detoxification of many poisons and drugs. Which of the following structures is primarily involved in this process and therefore abundant in liver cells?

- A) Rough ER
- B) Smooth ER
- C) Golgi apparatus
- D) Nuclear envelope
- E) Transport vesicles

10) 49) Which of the following produces and modifies polysaccharides that will be secreted?

- A) Lysosome
- B) Vacuole
- C) Mitochondrion
- D) Golgi apparatus
- E) Peroxisomes

11) Which type of organelle is primarily involved in the synthesis of oils, phospholipids, and steroids?

- A) Ribosome
- B) Lysosome
- C) Smooth endoplasmic reticulum
- D) Mitochondrion
- E) Contractile vacuole

12) Which of the following contains hydrolytic enzymes?

- A) Lysosomes

- B) Vacuole
- C) Mitochondrion
- D) Golgi apparatus
- E) Peroxisomes

13) Which of the following are capable of converting light energy to chemical energy?

- A) Chloroplasts
- B) Mitochondria
- C) Leucoplasts
- D) Peroxisomes
- E) Golgi bodies

14) Which of the following is a function of cell wall?

- A) Prevent excessive uptake of the water
- B) Protection
- C) Maintain the cell shape
- D) Holding plant against gravity
- E) All of the above

15) Which of the following is true about free ribosomes?

- A) It is attached to the nuclear envelope
- B) It is attached to the ER
- C) They produce the proteins that must be secreted out the cell
- D) Producing cytoplasmic proteins
- E) None of the above

16) ----- is a framework of protein fibres extending throughout the nuclear interior

- A) Nuclear lamina
- B) Nuclear matrix
- C) Middle lamella
- D) Pore complex
- E) None of the above

17) For studying Phagocytosis (Lysosome function) , the best cells used to study it:

- A) Liver cells
- B) Red blood cells
- C) Macrophages
- D) Skin cell
- E) None of the above

18) The main function of cell fractionation?

- Separation of major organelles and sub-cellular components

19) Which of the following is not a function of cytoskeleton?

- A) Transporting of molecules into the cell
- B) Transporting of molecules within the cell
- C) Providing structure and shape
- D) Anchoring the cell
- E) Cell movement

20) Which of the following organelles is absent in plant cells?

- A) Plasma membrane
- B) Cell wall
- C) Chloroplast
- D) Central vacuole
- E) Centrosome

21) Grana and thylakoid can be found in:

- A) Mitochondria
- B) Chloroplasts
- C) Golgi
- D) Rough ER
- E) Peroxisomes

22) All of the following is found in prokaryotic cells except

- A) DNA
- B) Chromosomes
- C) Ribosomes
- D) Cytosol
- E) Nuclear envelope

23) Which of the following organelles responsible of proteins synthesis

- A) Ribosomes
- B) Lysosomes
- C) Mitochondria
- D) Microtubule
- E) Nucleus

24) Large number of ribosomes can be found in cells that produce:

- A) Proteins
- B) Carbohydrate
- C) Lipids
- D) DNA
- E) RNA

25) Which type of junctions establishes a barrier that prevents leakage of extracellular fluid across a layer of epithelial cells?

- A) Tight Junction
- B) Gap junction
- C) Desmosomes
- D) Plasmodesmata
- E) None of the above

26) Ribosomes can be seen by:

- A) Light microscope
- B) Electron microscope
- C) Unaided eye
- D) None of the above
- E) All of the above

27) Under which of the following conditions would you expect to find a cell with a predominance of free ribosomal?

- A) A cell that is secreting proteins
- B) A cell that is producing cytoplasmic enzymes
- C) A cell that is constructing its cell wall or extracellular matrix
- D) A cell that is digesting food particles
- E) A cell that is enlarging its vacuole

28) Materials from one animal cell can enter adjacent cell by :

- A) Tight Junction
- B) Gap Junction
- C) Desmosome
- D) Microfilament
- E) Intermediate filament

29) Microtubules are not involved in?

- A) Cilia
- B) Flagella
- C) Movement of organelles
- D) Cell division
- E) Amoeboid movement

30) The plant cell's central vacuole :

- A) Play a major role in growth
- B) Store nutrient
- C) Reservoir of Inorganic ions
- D) Occupied large space of the cell
- E) All of the above

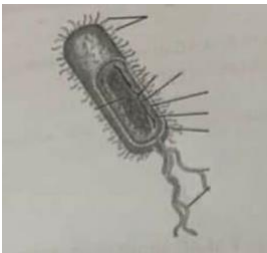
31) The nuclear envelope is directly connect to:

- A) Endoplasmic reticulum
- B) Golgi apparatus
- C) Lysosomes
- D) Peroxisomes
- E) Food vacuole

32) Which of the following found in both bacteria and plant cells:

- A) Chloroplasts
- B) Cell wall
- C) Nucleus
- D) Mitochondria
- E) None of the above

33) The figure represents:



- A) Prokaryote
- B) Eukaryote

- C) Animal cell
- D) Plant cell
- E) Protists

34) Which of the following is a function of the smooth ER?

- A) Detoxification of drugs
- B) Storage of calcium ions
- C) Synthesis of lipids
- D) Synthesis of glycoproteins and secretory proteins
- E) All of them except (D)

35) The organelle that can carry out (Autophagy process) is:

- A) Golgi
- B) ER
- C) Nucleus
- D) Mitochondria
- E) Lysosomes

36) The correct pathway of secretory proteins:

- A) Rough ER - Lysosome - Golgi - Plasma membrane
- B) Smooth ER - Golgi - Transport vesicles - Plasma membrane
- C) Rough ER - Golgi - Transport vesicle - Plasma membrane
- D) Golgi - Lysosome - Plasma membrane
- E) None of the above

37) The type of junction that can be seen between heart (Cardiac muscles) is

- A) Tight junction
- B) Gap junction
- C) Desmosomes
- D) Plasmodesmata
- E) None of the above

38) Which of the following IS FALSE about lysosomes:

- A) Can digest food and damage organelles
- B) They are membranous
- C) Contain hydrolytic enzymes
- D) Has basic environment
- E) All of the above is true

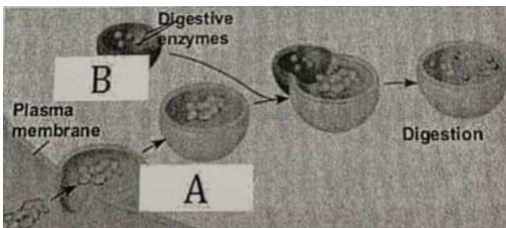
39) Cell wall can be found :

- A) Plant cells only
- B) Animal cells only
- C) In both animal and plant cells
- D) In plant cells and some prokaryote
- E) Any of the above

40) Which of the following is correct?

- A) Larger organisms have larger cells
- B) Larger organisms have more cells
- C) Surface area to volume ratio is large in smaller cells
- D) Surface area to volume ratio is small in smaller cells
- E) Both B and C are correct

41) According to the figure , (A) represent:



- A) Lysosome
- B) Food vacuole
- C) Contractile vacuole
- D) Peroxisomes

42) Chloroplasts and mitochondria have in common a :

- A) Both of them bounded by double membrane
- B) Both of them contain DNA
- C) Both of them involved in energy conversion
- D) Both of them involved in digestion of food
- E) All of them true except of (D)

43) Which of the following is a compartment that often takes up much of the volume of a plant cell

- A) Lysosome
- B) Vacuole
- C) Mitochondrion
- D) Golgi apparatus
- E) Peroxisomes

ANSWERS

- A. A
- B. C
- C. B
- D. E
- E. E
- F. D
- G. A

- 1) D
- 2) A
- 3) C
- 4) C
- 5) C
- 6) C
- 7) D
- 8) A
- 9) B
- 10) D
- 11) C
- 12) A
- 13) A
- 14) E
- 15) D
- 16) B
- 17) C
- 18) ...
- 19) A
- 20) E
- 21) B
- 22) E
- 23) A
- 24) A
- 25) A
- 26) B
- 27) B
- 28) B
- 29) E
- 30) E
- 31) A
- 32) B
- 33) A
- 34) E
- 35) E

- 36) C
- 37) B
- 38) D
- 39) D
- 40) E
- 41) B
- 42) E
- 43) B

ولله الحمد حتى يرضى

نَعُوذُ بِكَ مِنْ ذُبُولِ السَّعْيِ فِي مُنْتَصَفِ الطَّرِيقِ ... وَنَعُوذُ بِكَ مِنْ انْطِفَاءِ الرُّوحِ ؛ بِخَفِيِّ الدُّنُوبِ !



PAST PAPERS



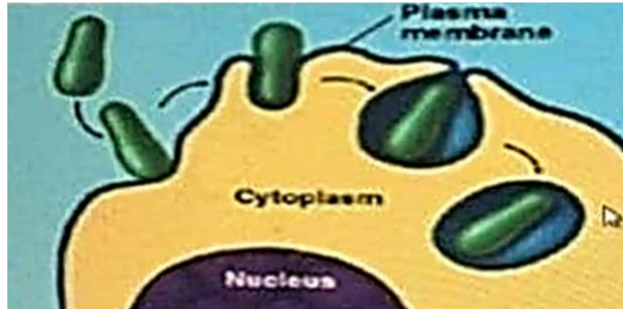
BIOLOGY

DONE BY: **Ayat Nabil**

قال تعالى: {وَفِي الْأَرْضِ آيَاتٌ لِلْمُوقِنِينَ * وَفِي أَنْفُسِكُمْ أَفَلَا تُبْصِرُونَ * وَفِي السَّمَاءِ رِزْقُكُمْ وَمَا تَوَعَّدُونَ * فَوَرَبَّ السَّمَاءِ وَالْأَرْضِ إِنَّهُ لَحَقٌّ مِثْلَ مَا أَنَّكُمْ تَنْطِفُونَ} [سورة الذاريات : 20-23]

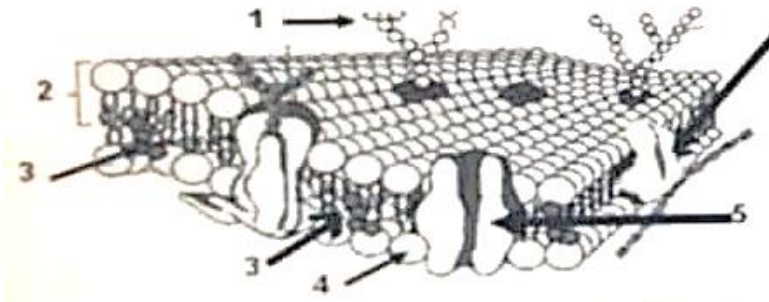
CHAPTER 8

1. This process in the figure demonstrates



- Pinocytosis
 - Phagocytosis
 - Receptor-mediated endocytosis
 - Photosynthesis
 - contractile vacuole active transport
2. What are the membrane structures that function in active transport?
- Peripheral proteins
 - Carbohydrates
 - Receptor proteins
 - Carrier proteins
 - All of the above
3. Facilitated diffusion:
- Requires either channel or carrier proteins
 - Occur down a concentration gradient
 - Require the hydrolysis of ATP
 - Occur in all cells
 - All of the above are correct except C
4. Which of the following is an electrogenic pump?
- $\text{Na}^+\text{-K}^+$ pump
 - Glucose carrier
 - H^+ pump
 - All of the above
 - Only A and C

5. Which structure can function as aquaporin?



- a) 1
- b) 2
- c) 3
- d) 4
- e) 5

6. In order for a protein to be an integral membrane protein it would have to be:

- a) Hydrophilic
- b) Hydrophobic
- c) Amphipathic, with at least one hydrophobic region
- d) Completely covered with phospholipids
- e) Exposed on only one surface of the membrane

7. Which of the following types of molecules are the major structural components of the cell membrane?

- a) Phospholipids and cellulose
- b) Nucleic acids and proteins
- c) Phospholipids and proteins
- d) Proteins and cellulose
- e) Glycoproteins and cholesterol

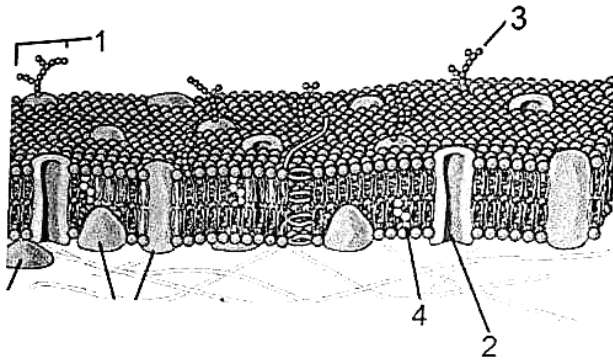
8. Which of the following is true of integral membrane proteins?

- a) They lack tertiary structure
- b) They are loosely bound to the surface of the bilayer
- c) They are usually transmembrane proteins
- d) They are not mobile within the bilayer
- e) They serve only a structural role in membranes

9. The primary function of polysaccharides attached to the glycoproteins and glycolipids of animal cell membranes is
- a) To facilitate diffusion of molecules down their concentration gradients
 - b) To actively transport molecules against their concentration gradients
 - c) To maintain the integrity of a fluid mosaic membrane
 - d) To maintain membrane fluidity at low temperatures
 - e) To mediate cell-to-cell recognition

10. Water passes quickly through cell membrane because:
- a) It is small polar molecule
 - b) Its movement is driven by ATP hydrolysis
 - c) It moves through aquaporins
 - d) The membrane bilayer is hydrophilic
 - e) The membrane interior is hydrophobic

11. Which structure can function as aquaporin?



- a) 1
 - b) 2
 - c) 3
 - d) 4
 - e) None of the above
12. Which of the following statements correctly describes the normal tonicity conditions for typical plant and animal cells?
- a) The animal cell is in a hypotonic solution, and the plant cell is in an isotonic solution.
 - b) The animal cell is in an isotonic solution, and the plant cell is in a hypertonic solution.
 - c) The animal cell is in a hypertonic solution, and the plant cell is in an isotonic solution.
 - d) The animal cell is in an isotonic solution, and the plant cell is in a hypotonic solution.
 - e) The animal cell is in a hypertonic solution, and the plant cell is in a hypotonic solution.

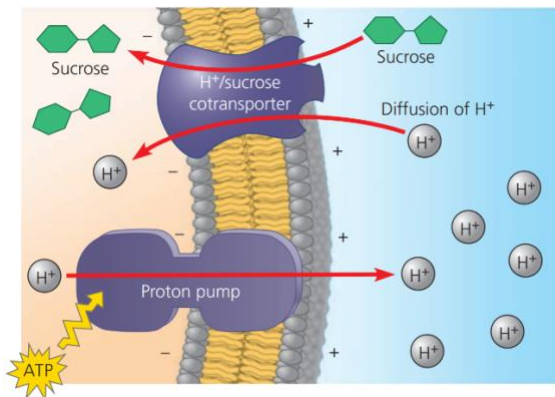
13. Which of the following functions of membrane proteins involves surface carbohydrate?

- a) Cell-cell recognition
- b) Enzymatic activity
- c) Transport
- d) Tight junctions
- e) None of the above

14. What kinds of molecules pass through a cell membrane most easily?

- a) Large and hydrophobic
- b) Small and hydrophobic
- c) Large polar
- d) Ionic
- e) Monosaccharides such as glucose

15. In the figure shown, a proton passes to the cytosol:

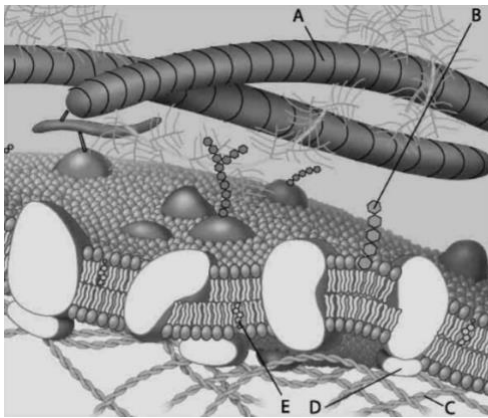


- a) Down its concentration gradient
- b) By simple diffusion
- c) Against its concentration gradient
- d) Down its electrochemical gradient
- e) None of the above

16. What is the voltage across a membrane called?

- a) Water potential
- b) Chemical gradient
- c) Membrane potential
- d) Osmotic potential
- e) Electrochemical gradient

According to the figure below, answer questions 17, 18 and 19:



17. Which component is the peripheral protein?

- a) A
- b) B
- c) C
- d) D
- e) E

18. Which component is cholesterol?

- a) A
- b) B
- c) C
- d) D
- e) E

19. Which component is a glycolipid?

- a) A
- b) B
- c) C
- d) D
- e) E

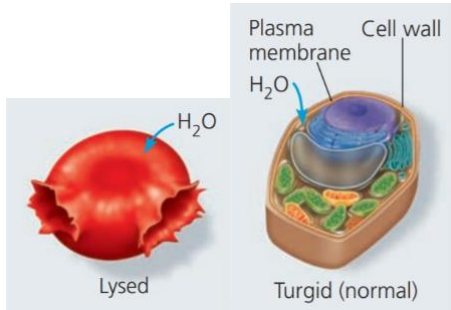
20. Fluid mosaic model of the membrane proposed that

- a) Membranes are a phospholipid bilayer
- b) Membranes are a phospholipid bilayer between two layers of hydrophilic proteins
- c) Membranes are a single layer of phospholipids and proteins
- d) Membranes consist of protein molecules embedded in a fluid bilayer of phospholipids
- e) Membranes consist of a mosaic of polysaccharides and proteins

21. Which of the following is involved in engulfing of droplets contains dissolved materials?

- a) Phagocytosis
- b) Pinocytosis
- c) Receptor mediated endocytosis
- d) Exocytosis
- e) Facilitated diffusion

22. These cells can be found in:



- a) Hypertonic solution
- b) Hypotonic solution
- c) Isotonic solution
- d) None of the above
- e) All of the above

23. Which of the following is true about sodium potassium pump?

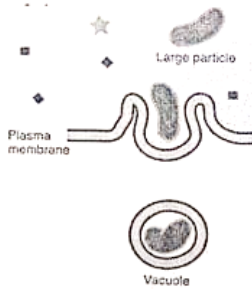
- a) It can pump 3 sodium ions out of the cell
- b) It can pump 2 potassium ions into the cell
- c) The pump powered by ATP
- d) The process is an active transport
- e) All of the above are true

24. "Co-transport" is:

- a) Coupling of uphill to a downhill one
- b) Using of ATP to transport materials against their concentration
- c) Using of ATP to transport materials down their concentration
- d) "Proton-sucrose" co-transporter is an example for this process
- e) Both A and D are correct

كن ابن من شئت واكتسب أدباً .. يغنيك محموده عن النسب
إنَّ الفتي من يقولُ ها أنا ذا .. ليسَ الفتي من يقولُ كانَ أبي

25. The figure shows:



- a) Phagocytosis
- b) Pinocytosis
- c) Receptor mediated endocytosis
- d) Exocytosis
- e) Facilitated diffusion

26. Ions diffuse across membranes through specific ion channels

- a) Down their chemical gradients
- b) Down their concentration gradients
- c) Down the electrical gradients
- d) Down their electrochemical gradients
- e) Down the osmotic potential gradients

27. Water enters and leaves plant and animal cells by:

- a) Pinocytosis
- b) Simple diffusion
- c) Osmosis
- d) Co-transport
- e) Bulk transport

28. Low density lipoproteins (LDL) enter cells by:

- a) Pinocytosis
- b) Phagocytosis
- c) Active transport
- d) Receptor mediated endocytosis
- e) Passive transport

29. Nonpolar small hydrocarbons, CO₂, and O₂ cross the membrane by:

- a) Simple diffusion
- b) Active transport
- c) Facilitated diffusion

- d) Bulk transport
- e) Co-transport

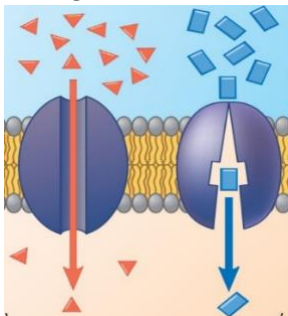
30. When plant cells are placed in hypertonic solution, they will

- a) Lyse
- b) Be turgid
- c) Plasmolyze
- d) Shrink
- e) Be flaccid

31. The secretion of substances out of the cell through small vesicles is an example of:

- a) Exocytosis
- b) Pinocytosis
- c) Endocytosis
- d) Osmoregulation
- e) Phagocytosis

32. The figure shows:

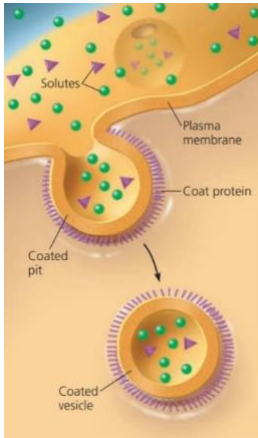


- a) Co-transport
- b) Osmosis
- c) Ion pump
- d) Facilitated diffusion
- e) Phagocytosis

33. Channel proteins are required for:

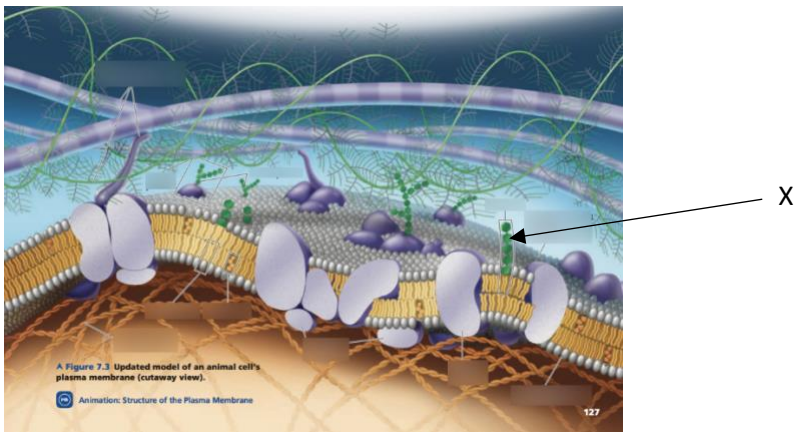
- a) Osmosis
- b) Facilitated diffusion
- c) Active transport
- d) Phagocytosis
- e) A and B are correct

34. This figure shows the processes of:



- a) Exocytosis
- b) Phagocytosis
- c) Pinocytosis
- d) Receptor mediated endocytosis
- e) Osmosis

35. The part pointed at (X) in the figure represents



- a) Carbohydrate
- b) Cholesterol
- c) Phospholipid
- d) Collagen fiber
- e) Fatty acid

36. Which of the following is involved in the Na^+ passive transport across plasma membrane?

- a) ATP
- b) Electrical membrane potential (electrical force)

- c) Gated channel proteins
- d) Na⁺ concentration gradient (chemical force)
- e) B and D are correct

37. One of the functions of cholesterol in animal cell membrane is to:

- a) Store energy
- b) Maintain membrane fluidity
- c) Speed diffusion
- d) Phosphorylate ADP
- e) None of the above

ANSWERS

1	b	14	b	27	c
2	d	15	a	28	d
3	e	16	c	29	a
4	e	17	d	30	c
5	e	18	e	31	a
6	c	19	b	32	d
7	c	20	d	33	e
8	c	21	b	34	c
9	e	22	b	35	a
10	c	23	e	36	e
11	b	24	e	37	b
12	d	25	a		
13	a	26	d		

تَلْمَحْ فَجْرَ الْأَجْرِ يَهْنُ ظِلَامَ التَّكْلِيفِ
-ابن الجوزي-

CHAPTER 6

1. The minimum amount of energy needed for a reaction is known as:
 - a) Entropy
 - b) Activation energy
 - c) endothermic level
 - d) Equilibrium point
 - e) Free energy

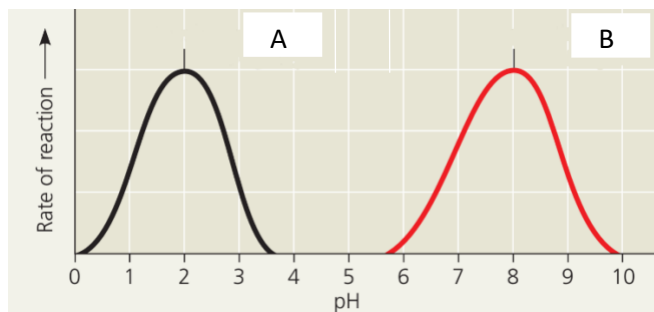
2. Which of the following is not a product of hydrolysis of ATP?
 - a) ADP
 - b) Energy
 - c) Pi (inorganic phosphate)
 - d) Amino acids
 - e) ADP and Pi

3. In exergonic reaction, energy is:
 - a) Transformed into light
 - b) Used
 - c) Either released or used
 - d) Transformed into heat
 - e) Released

4. Reactant capable of interacting to form products in a chemical reaction must first overcome a thermodynamic barrier known as the reaction's:
 - a) Entropy
 - b) Activation energy
 - c) Endothermic level
 - d) Equilibrium point
 - e) Free energy

5. The transfer of free energy from exergonic pathways to endergonic pathways is best called:
 - a) Feedback inhibition
 - b) ATP cycle
 - c) Energy coupling
 - d) Cooperativity
 - e) None of the above

6. Catabolic pathways:
- Provide the cell with energy, primarily in the form of ATP to do work
 - Are endergonic
 - Combine molecules into more energy-rich molecules
 - Are nonspontaneous
 - Do not need enzyme catalysis
7. Which of the following is (are) true for anabolic pathways?
- They do not depend on enzymes.
 - They are usually highly spontaneous chemical reactions.
 - They consume energy to build up polymers from monomers.
 - They release energy as they degrade polymers to monomers.
 - They consume energy to decrease the entropy of the organism and its environment.
8. Which term most precisely describes the cellular process of breaking down large molecules into smaller ones?
- Catalysis
 - Metabolism
 - Anabolism
 - Dehydration
 - Catabolism
9. Which of the following represents a curve for an enzyme can be found in stomach? a) A, or b) B



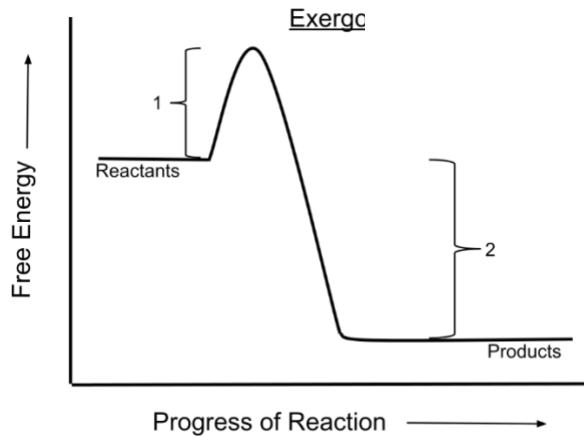
10. A negative delta G for a chemical process indicates:
- A reaction is exergonic
 - The products of the chemical process store less energy than the reactants
 - The reaction can happen spontaneously
 - The reaction can proceed without an input of energy
 - All of the above is correct

11. A chemical reaction that has a positive delta G is correctly described as:
- Endergonic
 - Spontaneous
 - Endothermic
 - Exergonic
 - Both a and b are correct
12. Which of the following is FALSE about exergonic reactions?
- They are spontaneous
 - They are energy releasing
 - They have negative delta G
 - They are mostly catabolic
 - The products have higher total energy than the reactants
13. Some bacteria are metabolically active in hot springs because:
- They are able to maintain a lower internal temperature
 - High temperatures make catalysis unnecessary
 - Their enzymes have high optimal temperatures
 - Their enzymes are completely insensitive to temperature
 - They use molecules other than proteins or RNAs as their main catalysts
14. How does a non-competitive inhibitor decrease the rate of an enzyme reaction?
- By binding at the active site of the enzyme
 - By changing the shape of the enzyme's active site
 - By changing the free energy change of the reaction
 - By acting as a coenzyme for the reaction
 - By decreasing the activation energy of the reaction
15. The mechanism in which the end product of a metabolic pathway inhibits an earlier step in the pathway is most precisely described as:
- Metabolic inhibition
 - Feedback inhibition
 - Allosteric inhibition
 - Non-cooperative inhibition
 - Reversible inhibition

البغى في الدنيا قصير عمره .. وإن احتمى بالجند والأموال
ضرب الرجال وهم أسارى قيدهم .. من شيمة الأوغاد لا الأبطال

16. Enzymes catalyze chemical reactions by:
- Adding heat to the system
 - Reacting with substrates to form new products
 - Increasing activation energy
 - Decreasing activation energy
 - Decreasing free energy

17. This reaction could be an _____ (a) Endergonic/(b) Exergonic).



18. Coenzymes are usually:
- Inorganic cofactors
 - Organic factors
 - Vitamins
 - Allosteric regulators
 - Both b and c are correct
19. Allosteric enzymes:
- Enzymes that are easily denatured
 - Enzymes that are unable to be denatured
 - Enzymes that can change its shape between active and inactive form
 - Enzymes that can be only activated
 - None of the above
20. In a spontaneous change:
- The free energy of a system decreases
 - The system becomes more stable
 - The released free energy can be harnessed to do work
 - Always move away from equilibrium
 - All of the above is true except D

21. During a laboratory experiment, you discover that an enzyme-catalyzed reaction has a ΔG of -20 kcal/mol. If you double the amount of enzyme in the reaction, what will be the ΔG for the new reaction?
- a) -40 kcal/mol
 - b) -20 kcal/mol
 - c) 0 kcal/mol
 - d) +20 kcal/mol
 - e) +40 kcal/mol
22. Induced fit results from binding of _____ to an enzyme.
- a) Vitamins
 - b) Non-competitive inhibitor
 - c) Specific substrate molecule
 - d) b and c
 - e) None of the above
23. If an enzyme in solution is saturated with substrate, the most effective way to obtain a faster yield of products is to:
- a) Add more of the enzyme
 - b) Heat the solution to 90°C
 - c) Add more substrate
 - d) Add an allosteric inhibitor
 - e) Add a noncompetitive inhibitor
24. Allosteric inhibitors act as:
- a) Competitive inhibitors
 - b) Coenzymes
 - c) Non-competitive inhibitors
 - d) Cofactors
 - e) Either competitive or non-competitive inhibitors
25. Allosteric enzyme regulation is usually associated with:
- a) Lack of cooperativity
 - b) Feedback inhibition
 - c) Activating activity
 - d) An enzyme with more than one subunit
 - e) The need for cofactors

26. Enzyme activity could be affected by:

- a) A competitive inhibitor
- b) Non-competitive inhibitor
- c) Allosteric activation
- d) Certain chemicals
- e) All of the above

27. Increasing the substrate concentration in an enzymatic reaction could overcome which of the following?

- a) Denaturization of the enzyme
- b) Allosteric inhibition
- c) Competitive inhibition
- d) Saturation of the enzyme activity
- e) Insufficient cofactors

28. The enzyme can speed the chemical reaction by:

- a) Speeding the movement of molecules
- b) Lowering the activation energy
- c) Increasing the number of substrate molecules
- d) All of the above
- e) None of the above

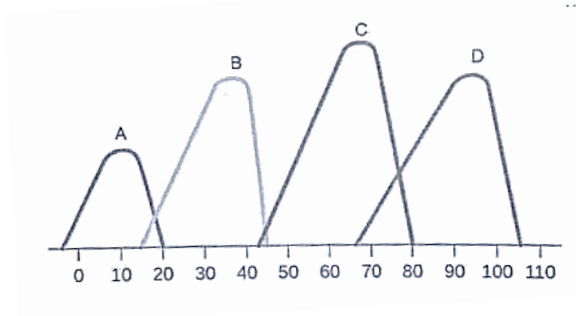
29. Why is ATP an important molecule in metabolism?

- a) Its hydrolysis provides an input of free energy for exergonic reactions.
- b) It provides energy coupling between exergonic and endergonic reactions.
- c) Its terminal phosphate group contains a strong covalent bond that, when hydrolyzed, releases free energy.
- d) Its terminal phosphate bond has higher energy than the other two.
- e) It is one of the four building blocks for DNA synthesis.

30. Which of the following is most similar in structure to ATP?

- a) A pentose sugar
- b) A DNA nucleotide
- c) An RNA nucleotide
- d) An amino acid with three phosphate groups attached
- e) A phospholipid

31. Which of the following curves represent optimal temperature of a human enzyme?



- a) A
- b) B
- c) C
- d) D
- e) None of the above

32. In the cell, coupling reactions need the use of:

- a) Amino acids
- b) Light
- c) Sugars
- d) Fatty acids
- e) ATP

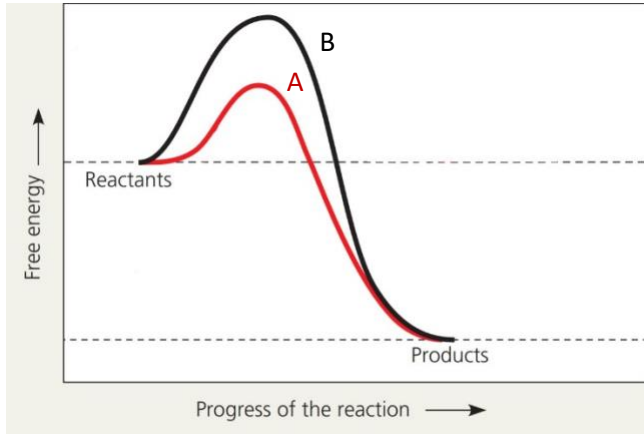
33. If an enzyme is added to a solution where its substrate and product are in equilibrium, what will occur?

- a) Additional product will be formed
- b) Additional substrate will be formed
- c) The reaction will change from endergonic to exergonic
- d) The free energy of the system will change
- e) Nothing; the reaction will stay at equilibrium

34. The active site of an enzyme is the region that:

- a) Binds to a noncompetitive inhibitor
- b) Binds to an allosteric inhibitor
- c) Binds to an allosteric activator
- d) Binds to a heme group
- e) Binds to substrate(s)

35. Which of the following represents an un-catalyzed reaction? a) A, or b) B



36. The nitrogenous base adenine is found in all members of which group?

- a) Proteins, triglycerides, and testosterone
- b) Proteins, ATP, and DNA
- c) ATP, RNA, and DNA
- d) Alpha glucose, ATP and DNA
- e) Proteins, carbohydrates, and ATP

ANSWERS

1	b	13	c	25	d
2	d	14	b	26	e
3	e	15	b	27	c
4	b	16	d	28	b
5	c	17	b	29	b
6	a	18	e	30	c
7	c	19	c	31	b
8	e	20	e	32	e
9	a	21	b	33	e
10	e	22	c	34	e
11	a	23	a	35	b
12	e	24	c	36	c

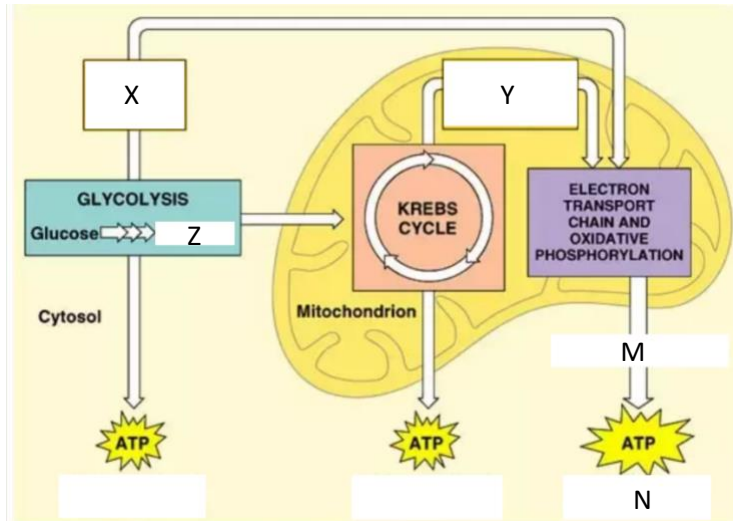
بقدر ما تتعنى .. تنال ما تتمنى

{ وَلَقَدْ آتَيْنَا دَاوُودَ وَسُلَيْمَانَ عِلْمًا وَقَالَا الْحَمْدُ لِلَّهِ الَّذِي فَضَّلَنَا عَلَى كَثِيرٍ مِّنْ عِبَادِهِ الْمُؤْمِنِينَ } [سورة النمل: 15]

وفي الآية دليل على شرف العلم وإنفاة محله وتقدم حملته وأهله ، وأن نعمة العلم من أجل النعم وأجزل القسم ، وأن من أوتيته فقد أوتي فضلًا على كثير من عباد الله المؤمنين .

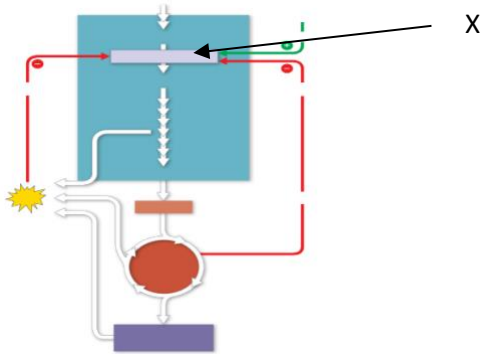
CHAPTER 10

1. In the figure, the product Z is:



- 3 acetyl CoA molecules
 - 2 pyruvate molecules
 - 3 oxaloacetate molecules
 - Citrate
 - Fructose bisphosphate
2. The starting molecule in the citric acid cycle that reacts with acetyl CoA and is regenerated at the end of the cycle is:
- Succinate
 - Fumarate
 - Alpha ketoglutarate
 - Oxaloacetate
 - Pyruvate
3. Production of ATP direct transfer of phosphate group from an organic substrate to ADP by enzymes is called:
- Oxidative phosphorylation
 - Substrate-level phosphorylation
 - Photophosphorylation
 - B-Oxidation
 - Deamination

4. Which of the following statements correctly describes the activity of enzyme (X)?



- a) It is inhibited by AMP
- b) It is activated by ATP
- c) It is activated by citrate
- d) It catalyzes the conversion of fructose into fructose 6-phosphate
- e) It is inhibited by citrate

5. Which of the following is true about (Phosphofructokinase enzyme)?

- a) It is the “Pacemaker” of cellular respiration
- b) It is inhibited by Citrate
- c) It is inhibited by ATP
- d) It is stimulated by AMP
- e) All of the above are correct

6. Chemiosmosis is described as an energy coupling mechanism that:

- a) Phosphorylates any substrate molecule
- b) Use the energy of proton gradient to drive chemical work
- c) Inhibit electron transfer along electron transport chain
- d) Creates proton motive force
- e) Lowers the pH in the mitochondrial intermembrane space

7. In electron transport chain, NADH passes its electrons to:

- a) Ubiquinone (Q)
- b) Cytochrome c
- c) Cytochrome a3
- d) Flavin mononucleotide (FMN)
- e) Cytochrome a

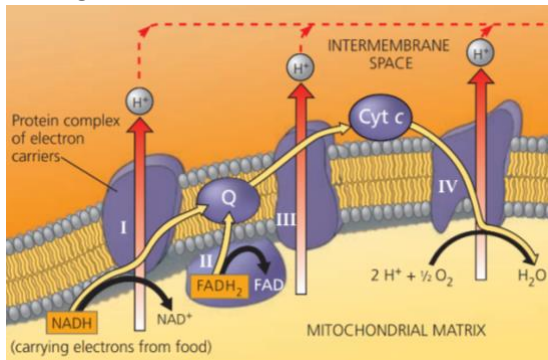
8. The ATP that made during glycolysis is generated by:
- Substrate level phosphorylation
 - Electron transport
 - Photophosphorylation
 - Chemiosmosis
 - Oxidation of NADH to NAD⁺
9. When hydrogen ions are pumped from the mitochondrial matrix across inner membrane, the result is the:
- Formation of ATP
 - Lowering pH of mitochondrial matrix
 - Reduction of NAD⁺
 - Creation of proton motive force
 - Loss of ATP
10. Chemiosmosis ATP synthesis (oxidative phosphorylation) occurs in:
- All respiring cells, both prokaryotic and eukaryotic, using oxygen or other electron acceptors
 - All cells, but only in the presence of oxygen
 - Only in mitochondria, using either oxygen or other electron acceptors
 - Only in eukaryotic cells, in the presence of oxygen
 - Only in prokaryotic cells, in absence of oxygen
11. Most of the CO₂ from the catabolism of glucose is released during:
- Chemiosmosis
 - Glycolysis
 - Electron transport
 - The citric acid cycle
 - Fermentation
12. During aerobic respiration, which of the following directly donates electrons to the electron transport chain at the lowest energy level?
- ATP
 - NADH
 - ADP + Pi
 - FADH₂
 - FADH

13. What is correct about the electron transport chain in anaerobic respiration?
- Can use oxygen as a final electron acceptor
 - Occurs in aerobic bacteria
 - Occurs in some prokaryotes
 - It is the fermentation of glucose
 - B and C are correct
14. In alcohol fermentation, NAD^+ is regenerated from NADH by:
- Reduction of acetaldehyde into ethanol
 - Oxidation of pyruvate to acetyl CoA
 - Reduction of pyruvate to lactate
 - Oxidation of ethanol to acetyl CoA
 - Reduction of ethanol to pyruvate
15. Carbon dioxide (CO_2) is released during which of the following stages of cellular respiration?
- Glycolysis and the oxidation of pyruvate to acetyl CoA
 - Oxidation of pyruvate to acetyl CoA and the citric acid cycle
 - The citric acid cycle and oxidative phosphorylation
 - Oxidative phosphorylation and fermentation
 - Fermentation and glycolysis
16. In cellular respiration, energy flows in the sequence:
- Glucose - NAD^+ - electron transport chain - ATP
 - Glucose - NADH - electron transport chain - proton motive force
 - Glucose - NADH - electron transport chain - O_2
 - NADH - glucose - pyruvate - Krebs cycle - H_2O
 - Pyruvate - Acetyl CoA - Flavoprotein - ADP
17. The energy responsible for ATP production during cellular respiration:
- Heat energy
 - Light energy
 - Food
 - Proton motive force
 - None of the above
18. The oxygen consumed during cellular respiration is involved directly in which process or event?
- Glycolysis
 - Accepting electrons at the end of the electron transport chain
 - The citric acid cycle

- d) The oxidation of pyruvate to acetyl CoA
 - e) The phosphorylation of ADP to form ATP
19. Which process in eukaryotic cells will proceed normally whether oxygen (O₂) is present or absent?
- a) Electron transport
 - b) Glycolysis
 - c) The citric acid cycle
 - d) Oxidative phosphorylation
 - e) Chemiosmosis
20. In cellular respiration, 90 percent of ATP is produced by:
- a) Glycolysis
 - b) Oxidative phosphorylation
 - c) Photophosphorylation
 - d) Substrate-level phosphorylation
 - e) Pyruvate oxidation
21. How many electrons are needed to pass the electron transport chain of the mitochondria for the formation of one molecule of water?
- a) 1
 - b) 2
 - c) 4
 - d) 6
 - e) 2 from NADH and 1 from FADH₂
22. How many ATP molecules produced if one glucose molecule is completely oxidized?
- a) 32
 - b) 2
 - c) 18
 - d) 16
 - e) 24
23. Carbohydrates and fats are considered high energy food because:
- a) They have a lot of oxygen atoms
 - b) They have no nitrogen in their makeup
 - c) They can have short carbon skeletons
 - d) They have a lot of electrons associated with hydrogen
 - e) They are easily reduced

24. Before amino acids can enter into glycolysis and TCA cycle, their amino group must be removed by a process called:
- Decarboxylation
 - Dehydrogenation
 - Carboxylation
 - Deamination
 - Immunization

25. This figure shows:



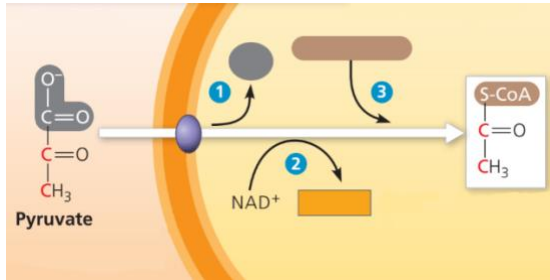
- Chemiosmosis
 - Substrate level phosphorylation
 - Electrochemical gradient
 - Oxidative phosphorylation
 - Electron transport chain creating a proton motive force
26. Which of the following factors control the cellular respiration?
- Intracellular ATP amount
 - Intracellular AMP amount
 - Citrate amount
 - Only a and b
 - All of the above

27. The reaction of fermentation function to regenerate _____ molecules for use in glycolysis.

- NAD⁺
- ATP
- Pyruvic acid
- NADH
- Glucose

أفنيّت يا مسكينٌ عمرِكَ بالتأوُّه والحزن
وقعدت مكتوف اليدين تقول حاربي الرّمن
ما لم تقم بالعبء أنت فمّن يقومُ به إذن

28. Upon oxidation of pyruvate to acetyl CoA, the product compound No. 1 in the gray circle is:



- a) NADH
- b) Coenzyme A
- c) Acetate
- d) Acetyl coenzyme A
- e) Carbon dioxide

29. During respiration:

- a) O_2 is oxidized and H_2O is reduced
- b) CO_2 is reduced and O_2 is oxidized
- c) $\text{C}_6\text{H}_{12}\text{O}_6$ is reduced and CO_2 is oxidized
- d) $\text{C}_6\text{H}_{12}\text{O}_6$ is oxidized and O_2 is reduced
- e) O_2 is reduced and CO_2 is oxidized

30. The final electron acceptor of the electron transport chain that functions in aerobic oxidative phosphorylation is:

- a) Oxygen
- b) Water
- c) NAD^+
- d) Pyruvate
- e) ADP

31. The term glycolysis refers to:

- a) Glucose synthesis
- b) Glucose isomerization to fructose
- c) Glucose phosphorylation
- d) Glucose break down to pyruvate
- e) Glucose polymerization into starch

32. The primary role of SO_4 ions in anaerobic cellular respiration is to:

- a) Combine with carbon, forming CO_2
- b) Yield energy in the form of ATP as it is passed down the chain
- c) Act as a final acceptor for electrons and hydrogen

- d) Combine with lactate, forming pyruvate
 - e) Combine with pyruvate, forming alcohol
33. The mechanism by which electron transport chain is coupled to ATP production by means of proton gradient is called:
- a) Substrate level phosphorylation
 - b) Oxidative phosphorylation
 - c) Krebs cycle
 - d) Chemiosmosis
 - e) Calvin cycle
34. Where does glycolysis take place in eukaryotic cells?
- a) Mitochondrial matrix
 - b) Mitochondrial outer membrane
 - c) Mitochondrial inner membrane
 - d) Mitochondrial intermembrane space
 - e) Cytosol
35. Where are the proteins of electron transport chain located?
- a) Cytosol
 - b) Mitochondrial inner membrane
 - c) Mitochondrial outer membrane
 - d) Mitochondrial intermembrane space
 - e) Mitochondrial matrix
36. The molecule that directly passes electrons to oxygen in the electron transport chain in mitochondria is:
- a) Flavoprotein
 - b) CoQ (Ubiquinone)
 - c) Cytochrome C
 - d) Cytochrome a₃
 - e) Iron sulphur protein
37. In glycolysis, for each molecule of glucose oxidized to pyruvate:
- a) Two molecules of ATP are used, and two molecules of ATP are produced
 - b) Two molecules of ATP are used, and four molecules of ATP are produced
 - c) Four molecules of ATP are used, and two molecules of ATP are produced
 - d) Two molecules of ATP are used, and six molecules of ATP are produced
 - e) Six molecules of ATP are used, and six molecules of ATP are produced

38. In addition to ATP, what are the end products of glycolysis?
- a) CO_2 and H_2O
 - b) CO_2 and pyruvate
 - c) NADH, H_2O and pyruvate
 - d) CO_2 and NADH
 - e) H_2O , FADH_2 and citrate
39. In prokaryote, the respiratory electron transport chain is located in:
- a) Mitochondrial inner membrane
 - b) Mitochondrial outer membrane
 - c) Cytoplasm
 - d) Plasma membrane
 - e) In bacterial outer membrane
40. Almost of the oxygen (O_2) consumed in breathing is converted to:
- a) Acetyl-CoA
 - b) Water
 - c) Carbon dioxide (CO_2)
 - d) ATP and NADH
 - e) Pyruvate
41. The number of NADH molecules produced from oxidation of one pyruvate to acetyl CoA and further oxidation in Krebs cycle is:
- a) 3 NADH
 - b) 6 NADH
 - c) 4 NADH
 - d) 8 NADH
 - e) None of the above
42. The transport of pyruvate into mitochondria depends on the proton-motive force across the inner mitochondrial membrane. How does pyruvate enter the mitochondrion?
- a) Active transport
 - b) Diffusion
 - c) Facilitated diffusion
 - d) Through a channel
 - e) Through a pore

43. Energy released by the electron transport chain is used to pump H⁺ into which location in eukaryotic cells?

- a) Cytosol
- b) Mitochondrial outer membrane
- c) Mitochondrial inner membrane
- d) Mitochondrial intermembrane space
- e) Mitochondrial matrix

44. The ATP made during fermentation is generated by which of the following?

- a) The electron transport chain
- b) Substrate-level phosphorylation
- c) Chemiosmosis
- d) Oxidative phosphorylation
- e) Aerobic respiration

45. Beta oxidation is: (What is the purpose of beta oxidation?)

- a) Breaking down of glucose into 2 pyruvate molecules
- b) Breaking down of fatty acids into two carbon fragments
- c) Converting of glucose to fatty acid
- d) Converting of fatty acid to protein
- e) None of the above

46. Which of the following statements describes the results of this reaction?



- a) C₆H₁₂O₆ is oxidized and O₂ is reduced
- b) O₂ is oxidized and H₂O is reduced
- c) CO₂ is reduced and O₂ is oxidized
- d) C₆H₁₂O₆ is reduced and CO₂ is oxidized
- e) O₂ is reduced and CO₂ is oxidized

47. When a glucose molecule loses a hydrogen atom as the result of an oxidation-reduction reaction, the molecule becomes:

- a) Hydrolyzed
- b) Hydrogenated
- c) Oxidized
- d) Reduced
- e) An oxidizing agent

48. When a molecule of NAD^+ (nicotinamide adenine dinucleotide) gains a hydrogen atom (not a proton), the molecule becomes:
- a) Dehydrogenated
 - b) Oxidized
 - c) Reduced
 - d) Redoxed
 - e) Hydrolyzed
49. In liver cells, the inner mitochondrial membranes are about five times the area of the outer mitochondrial membranes.
What purpose must this serve?
- a) It allows for an increased rate of glycolysis
 - b) It increases the surface for substrate-level phosphorylation
 - c) It allows for an increased rate of the citric acid cycle
 - d) It increases the surface for oxidative phosphorylation
 - e) It increases the area for glycogen storage
50. Where is ATP synthase located in the mitochondrion?
- a) Cytosol
 - b) Electron transport chain
 - c) Outer membrane
 - d) Inner membrane
 - e) Mitochondrial matrix
51. Which metabolic pathway is common to both fermentation and cellular respiration of a glucose molecule?
- a) The citric acid cycle
 - b) The electron transport chain
 - c) Glycolysis
 - d) Synthesis of acetyl CoA from pyruvate
 - e) Reduction of pyruvate to lactate

ANSWERS

1	b	18	b	35	b
2	d	19	b	36	d
3	b	20	b	37	b
4	e	21	b	38	c
5	e	22	a	39	d
6	b	23	d	40	b
7	d	24	d	41	c
8	a	25	e	42	a
9	d	26	e	43	d
10	a	27	a	44	b
11	d	28	e	45	b
12	d	29	d	46	a
13	c	30	a	47	c
14	a	31	d	48	c
15	b	32	c	49	d
16	b	33	b	50	d
17	d	34	e	51	c

أجمع عقلاء كل أمة على أن النعيم لا يُدرك بالنعيم
-إبراهيم الحربي-

{ فَتَبَسَّمْ ضَاحِكًا مِّن قَوْلِهَا وَقَالَ رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَىٰ وَالِدَيَّ وَأَنْ أَعْمَلَ
صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ } [سورة النمل: 19]



PAST PAPERS

الجامعة
القادسية



BIOLOGY

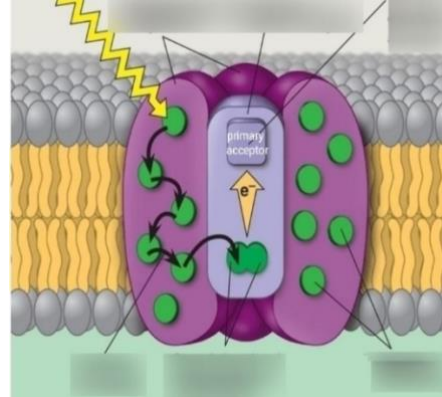
DONE BY: **Abdullah Na'eem**

PAST PAPERS

CH 11 :

1) The figure represents:

- A. ATP synthase
- B. Photosystem
- C. Channel protein
- D. Plastoquinone (Pq)
- E. None of the above



2) The CO₂ acceptor in Calvin cycle is:

- A. RUBP
- B. Rubisco
- C. Oxaloacetate
- D. Carbon monoxide
- E. None of the above

3) In the cyclic electron flow during photosystem:

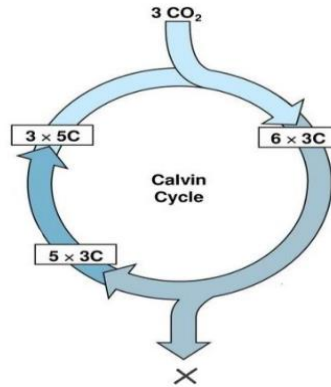
- A. No NADPH is produced
- B. No O₂ is produced
- C. Only ATP is produced
- D. Both NADPH and ATP are produced
- E. A, B and C are correct

- 4) If thylakoid membrane became leaky to H^+ , which of the following processes will be affected most?
- A. Absorption of photons
 - B. Linear electron flow
 - C. Cyclic electron flow
 - D. The synthesis of ATP
 - E. Splitting of water molecules
- 5) Which molecule is the CO_2 acceptor in the first step of the Calvin cycle?
- A. 3-phosphoglycerate
 - B. Ribulose biphosphate
 - C. G3P
 - D. Rubisco
 - E. Acetyl Co-A
- 6) Which of the following are products of the light reactions of Photosynthesis that are utilized in the Calvin cycle?
- A. CO_2 and glucose
 - B. H_2O and O_2
 - C. ADP, P_i , and $NADP^+$
 - D. Electrons and H^+
 - E. ATP and NADPH
- 7) Where does the Calvin cycle take place?
- A. Stroma of the chloroplast
 - B. Thylakoid membrane
 - C. Cytoplasm surrounding the chloroplast
 - D. Chlorophyll molecule
 - E. Outer membrane of the chloroplast

قال رسول الله صلى الله عليه وسلم:
(فوالله لأن يهدي الله بك رجلاً واحداً خيراً لك من أن يكون
لك حُمْر النعم)

8) The letter X represents?

- A. G3P
- B. RuBP
- C. glucose
- D. Oxaloacetate
- E. None of the above



9) In a plant cell, where are the ATP synthase complexes located?

- A. Thylakoid membrane
- B. Plasma membrane
- C. Inner mitochondrial membrane
- D. A and C
- E. A, B, and C

10) The splitting of carbon dioxide to form oxygen gas and carbon compounds occurs during:

- A. Photosynthesis.
- B. Respiration.
- C. Both photosynthesis and respiration.
- D. Neither photosynthesis nor respiration.
- E. Photorespiration.

11) Generation of proton gradients across membranes occurs during:

- A. Photosynthesis.
- B. Respiration.
- C. Both photosynthesis and respiration.
- D. Neither photosynthesis nor respiration.
- E. Photorespiration

- 12) In mechanism, photophosphorylation is most similar to
- A. Substrate - level phosphorylation in glycolysis
 - B. Oxidative phosphorylation in cellular respiration.
 - C. The Calvin cycle.
 - D. Carbon fixation.
 - E. Reduction of NADP.
- 13) Which of the following does not occur during the Calvin cycle?
- A. Carbon fixation
 - B. Oxidation of NADPH
 - C. Release of oxygen
 - D. Regeneration of the CO₂ acceptor
 - E. Consumption of ATP
- 14) The molecule that functions as the reducing agent (Electron donor) in a redox (Oxidation - Reduction) reaction:
- A. Gain electrons and gains potential energy
 - B. Loses electrons and loses potential energy
 - C. Gains electrons and loses potential energy
 - D. Loses electrons and gains potential energy
 - E. None of the above
- 15) An overall result of photosynthesis in plants is the use of electrons from water to reduce:
- A. Glucose
 - B. Carbon dioxide
 - C. Oxygen
 - D. Chlorophyll
 - E. NADPH

- 16) The reaction center chlorophyll of photosystem I is known as P700 because:
- A. There are 700 chlorophyll molecules in the center.
 - B. This pigment is best at absorbing light with a wavelength of 700 nm.
 - C. There are 700 photosystem I components to each chloroplast.
 - D. It absorbs 700 photons per microsecond.
 - E. The plastoquinone reflects light with a wavelength of 700
- 17) What are the products of linear photophosphorylation?
- A. Heat and fluorescence
 - B. ATP and P700
 - C. ATP and NADPH
 - D. ADP and NADP
 - E. P700 and P680
- 18) In photosynthesis, the chemiosmosis production of ATP:
- A. Is done by Calvin cycle
 - B. Require the input of NADPH
 - C. Is typically similar to ATP production of ATP in mitochondria
 - D. A and B
 - E. None of the above
- 19) In the light reactions in photosynthesis, the final acceptor of both electrons and protons is:
- A. NAD^+
 - B. NADP^+
 - C. The primary electron acceptor
 - D. B and C
 - E. Either A or B

بقدر الكدِّ تكتسبُ المعالي ** ومن طلب العلا سهر الليلي
ومن رام العلا من غير كدِّ ** أضع العمر في طلب المحال
تروم العزُّ ثم تنام ليلاً ** يغوص البحر من طلب اللآلي

20) In a photosystem, clusters of chlorophyll a, chlorophyll b, carotenoids pigments in addition to proteins collectively make:

- A. The light harvesting complexes
- B. The reaction center
- C. The primary electron acceptor
- D. P680 and P700
- E. None of those

21) Which is the correct order for the stages of the Calvin cycle?

- A. Carbon fixation, Regeneration, Reduction
- B. Regeneration, Carbon fixation, Reduction
- C. Reduction, Carbon fixation, Regeneration
- D. Carbon fixation, Reduction, Regeneration
- E. None of these is correct

22) Which of the following is the BEST lights used for photosynthesis?

- A. Green and red
- B. Red and violet - blue
- C. Green and violet blue
- D. Red and yellow
- E. Orange and yellow

23) Synthesis of one molecule of G3P needs:

- A. 9 NADPH molecules
- B. 9 NADPH and 6 ATP
- C. 6 NADPH and 9 ATP
- D. Fixation of 3 CO₂ molecules, 6 NADPH, 9 ATP
- E. Fixation of 3 CO₂ molecules, 9 NADPH, 6 ATP

24) How is oxygen produced during photosynthesis?

- A. Split of CO₂
- B. Split of H₂O
- C. Split of H₂S
- D. Krebs cycle
- E. Cyclic electron flow

25) The part of chlorophyll molecule which absorbs light is:

- A. Porphyrin ring
- B. Hydrocarbon tail
- C. Mg atom
- D. A and B
- E. None of the above

26) Organisms capable of carrying out photosynthesis are described as:

- A. Phototroph
- B. Heterotroph
- C. Chemotrophic
- D. Decomposer
- E. Parasitic

27) The correct sequential flow of electrons from PSI to PSII is:

- A. PSII – Pq – Cytochrome – Pc – PSI
- B. Pq – PSII – Cytochrome – PSI – Pc
- C. Pc – PSII – Cytochrome – PSI – Pq
- D. PSI – Pq – Cytochrome – Pc – PSII
- E. PSI – Pc – Cytochrome – Pq – PSII

- 28) When water splits in the process of photosynthesis, what it does supply to oxidize P680:
- A. Electrons
 - B. Hydrogen
 - C. Carbon dioxide
 - D. Oxygen
 - E. ATP
- 29) In photosynthesis in plants, the transfer of electrons through electron transport chain provides energy to:
- A. Pump protons across intermembrane space
 - B. Pump protons across thylakoid membrane
 - C. Pump protons into the stroma
 - D. Pump protons into the matrix
 - E. None of the above
- 30) The electrons lost from the reaction center pigment of phosphorylation II are replaced by electrons from:
- A. ATP
 - B. Co₂
 - C. H₂O
 - D. NADPH
 - E. P700

من عرف قدر الأمر، هان عليه ما يبذل فيه

Answers:

1	B	11	C	21	D
2	A	12	B	22	B
3	E	13	C	23	D
4	D	14	B	24	B
5	B	15	B	25	A
6	E	16	B	26	A
7	A	17	C	27	A
8	A	18	C	28	A
9	D	19	B	29	B
10	D	20	A	30	C

يا عظيم الهممة لا يضرّك التفرد ** فإن طرق العلاء قليلة الإيناس

CH 16 :

- 1) Which of the following true about leading strand?
 - A. It needs only one primer
 - B. It is synthesized continuously
 - C. It is synthesized as a series of segments called the Okazaki fragments
 - D. It is elongated in 3' to 5' direction
 - E. Only A and B are correct

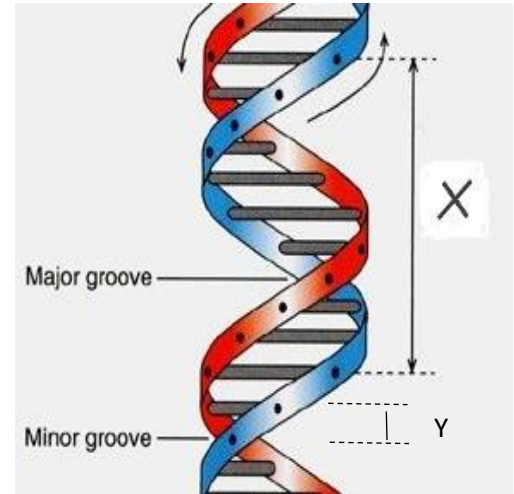
- 2) Synthesis of new DNA strand begins with:
 - A. An RNA primer
 - B. DNA primer
 - C. Okazaki fragment
 - D. Thymine dimer
 - E. DNA ligase

- 3) The radioactive isotope P32 labels the T2 phage's:
 - A. DNA
 - B. Tails
 - C. Proteins
 - D. Heat
 - E. Base plate

- 4) The enzyme that breaks, swivels, and rejoin the parental strands of DNA is:
 - A. Helicase
 - B. DNA polymerase I
 - C. DNA ligase
 - D. Primase
 - E. Topoisomerase

5) In this figure, the distance represented by letter (X):

- A. 0.34 nm
- B. 34 nm
- C. 3.4 nm
- D. 1 nm
- E. 2 nm



6) The letter (Y) shown in the figure equals:

- A. 0.34 nm
- B. 34 nm
- C. 3.4 nm
- D. 1 nm
- E. 2 nm

7) What kind of chemical bond is found between paired bases of the DNA double helix?

- A. Hydrogen
- B. Ionic
- C. Covalent
- D. Sulfhydryl
- E. Phosphodiester

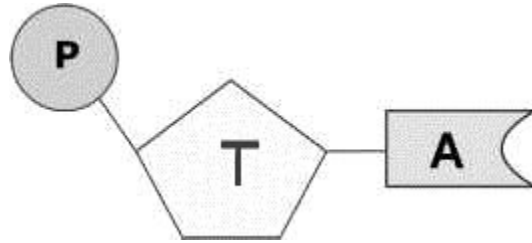
8) Which of the following can be said to be semiconservative process?

- A. Translation
- B. Transcription
- C. Replication
- D. Transduction
- E. Translation

قال رسول الله صلى الله عليه وسلم:
(سَلُوا اللَّهَ عِلْمًا نَافِعًا ، وَتَعَوَّدُوا بِاللَّهِ مِنْ عِلْمٍ لَا يَنْفَعُ).

9) Which of the following represent the sugar of nucleotide?

- A. P
- B. T
- C. A

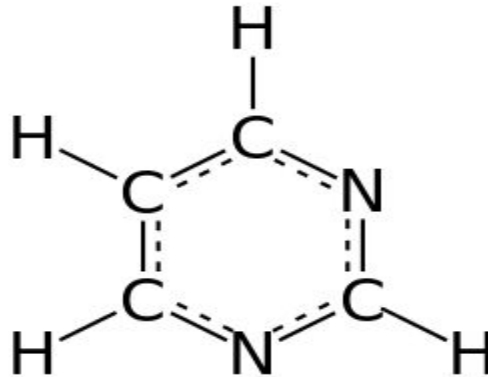


10) Which chemical group is at the 5' end of a single polynucleotide strand?

- A. Hydroxyl group
- B. Phosphate group
- C. Diester group
- D. Nitrogen group
- E. None of the above

11) The molecule shown in the figure is:

- A. Purine base
- B. Pyrimidine base
- C. Sugar
- D. Fatty acid
- E. Amino acid

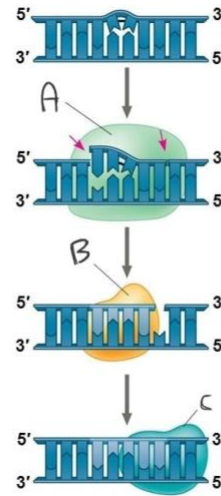


12) Cytosine makes up 38% of the nucleotide bases in a sample of DNA, what the percentage of the thymine in this sample will be?

- A. 12
- B. 24
- C. 31
- D. 38
- E. It cannot be determined

13) In this figure, which enzyme represents the enzyme DNA polymerase?

- A. A
- B. B
- C. C
- D. None of the above



14) DNA replication begins ----

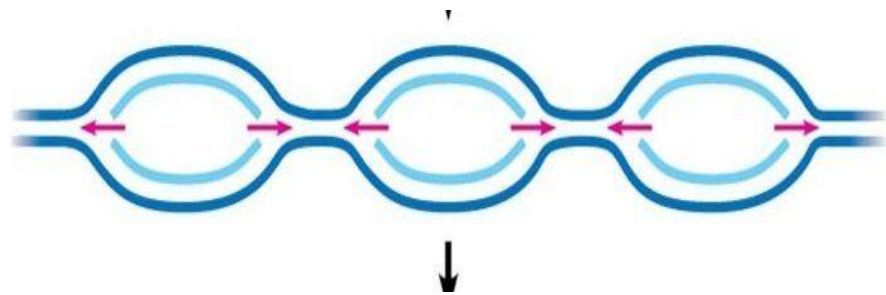
- A. At the replication fork
- B. At the lagging strand
- C. At the origin of replication
- D. At the start codon
- E. In the cytoplasm

15) A DNA strand grows only in 5' to 3' direction because:

- A. DNA polymerase can only add nucleotides to the 3' end of the growing strand
- B. DNA polymerase can only add nucleotides to the 5' end of the growing strand
- C. The DNA molecule only unwinds in the 5' to 3' direction
- D. DNA polymerase requires the addition of a starter nucleotide at the 5' end
- E. mRNA can only read a DNA molecule in the 5' to 3' direction

16) How many replication bubbles in this figure?

- A. 1
- B. 2
- C. 3
- D. 6
- E. 8



- 17) The scientists who demonstrated the double helix of DNA is:
- A. Franklin
 - B. Watson and crick
 - C. Hershey and chase
 - D. Chargaff
- 18) All of the following are functions of DNA polymerase except of:
- A. DNA Synthesis
 - B. Primer synthesis
 - C. DNA Proofreading
 - D. DNA repair
 - E. Replacement of RNA with DNA
- 19) What determines the nucleotide sequence of the newly synthesized strand during DNA replication?
- A. The particular DNA polymerase catalyzing the reaction
 - B. The relative amounts of the four nucleotide triphosphates in the cell
 - C. The nucleotide sequence of the template strand
 - D. The primase used in the reaction
 - E. The arrangement of histones in the sugar phosphate backbone
- 20) If adenine paired with guanine and cytosine paired with thymine the shape of DNA molecule would:
- A. Be longer
 - B. Be shorter
 - C. Be circular
 - D. Have irregular widths along its length
 - E. Be unwinded

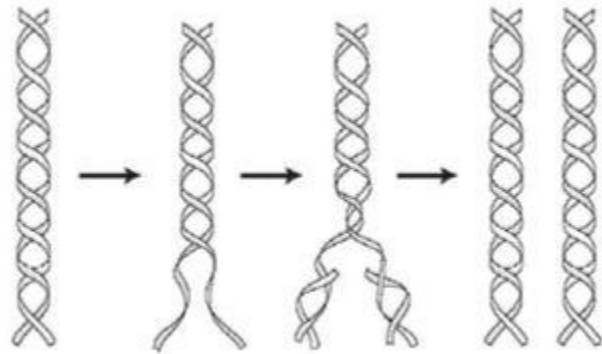
- 21) Multiple origins of replication on the DNA molecule of eukaryotic cell serve to:
- A. Removes errors in DNA replication
 - B. Creates multiple copies of the DNA molecule at the same time
 - C. Assures the correct orientation of the two strands in the newly growing double helix
 - D. Shortens the time necessary for DNA replication
 - E. b and d are correct
- 22) Who demonstrated that DNA is genetic material in T2 phage?
- A. Franklin
 - B. Watson and crick
 - C. Hershey and chase
 - D. Chargaff
- 23) An old DNA strand is used as ----- for the assembly of new DNA strand:
- A. Complement
 - B. Primer
 - C. Model
 - D. Template
 - E. Source of nucleotide
- 24) Which of the following is true about bacterial chromosome?
- A. Single linear strand of DNA
 - B. Double circular strand of DNA
 - C. Single circular strand of DNA
 - D. Double linear strand of DNA
 - E. Double linear strand of RNA

25) Which of the following enzymes is not involved in nucleotide excision repair:

- A. Nuclease
- B. Ligase
- C. Primase
- D. DNA polymerase
- E. Both A and C

26) The process shown is:

- A. Transcription
- B. Translation
- C. DNA replication
- D. Nucleosome formation
- E. None of the above



27) The enzyme that involved in replacement of RNA primers with DNA is:

- A. DNA poly III
- B. DNA poly I
- C. Ligase
- D. Helicase
- E. Primase

28) What is the role of DNA ligase in the elongation of the lagging strand during DNA replication?

- A. It synthesizes RNA nucleotides to make a primer
- B. It catalyzes the lengthening of telomeres
- C. It joins okazaki fragments together
- D. It unwinds the parental double helix
- E. It stabilizes the unwound parental double helix

29) The type of replication that occurs in our cells is:

- A. Conservative
- B. Semi - conservative
- C. Dispersive
- D. None of the above

30) The best way for pairing the nitrogenous bases within the double helix is:

- A. Purine + Purine
- B. Purine + Pyrimidine
- C. Pyrimidine + Pyrimidine
- D. A and B is a correct pairing
- E. None of the following is true

31) The short segments of newly synthesized DNA are joined into continuous strand by:

- A. Helicase
- B. DNA Polymerase
- C. Ligase
- D. Primase
- E. Single strand binding proteins

32) The first step of replication is catalyzed by:

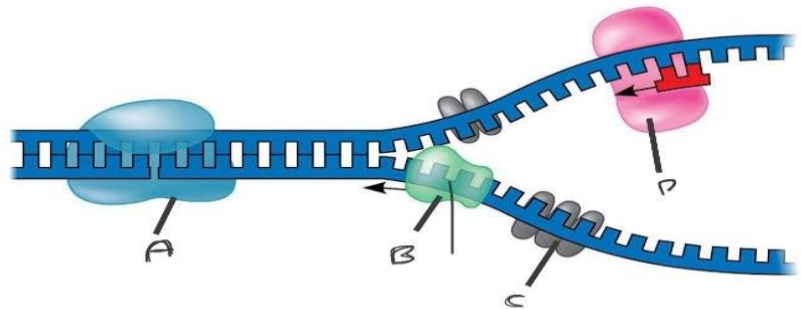
- A. Helicase
- B. DNA Polymerase
- C. Ligase
- D. Primase
- E. Single strand binding proteins

33) If % of G = 22, then the % of A =?

- A. 28 %
- B. 22 %
- C. 44 %
- D. 66 %
- E. None of the above

34) In this diagram, which letter represents the enzyme helicase?

- A. A
- B. B
- C. C
- D. D



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35) To repair thymine dimer by nucleotide excision repair, you need:

- A. Telomerase, Primase, DNA polymerase
- B. Telomerase, Helicase, single strand binding proteins
- C. Nuclease DNA polymerase, DNA Ligase
- D. DNA ligase, Replication fork proteins, Nuclease

36) In complementary base pairing in double helix of DNA, Adenine pairs with by:

- A. Thymine by three hydrogen bonds
- B. Guanine by two hydrogen bonds
- C. Thymine by two hydrogen bonds
- D. Cytosine with two hydrogen bonds

37) Which of the following prevent repairing of DNA strand?

- A. Helicase
- B. DNA Polymerase I
- C. Single strand binding proteins
- D. Ligase
- E. Primase

38) Which of the following is not property of DNA?

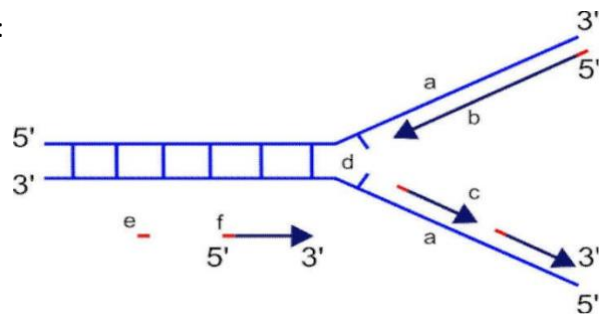
- A. Anti-parallel
- B. Double helix
- C. Held by ionic bonds
- D. Pair with histones
- E. All of the above is correct

لذة الراحة لا تنال بالراحة، والجنة حفت
بالمكاره، ولا يدرك السادة من لزم الوسادة

39) The correct order of DNA packaging is:

- A. Histone - Nucleosome – 30 nm fiber - 300 nm fiber (Looped domain) - metaphase chromosome
- B. 30 nm fiber - 300 nm fiber (Looped domain) – Histone – Nucleosome – metaphase chromosome
- C. 30 nm fiber - 300 nm fiber (Looped domain) - metaphase chromosome – Nucleosome - Histone
- D. Histone - Nucleosome – 30 nm fiber - 300 nm fiber (Looped domain) - metaphase chromosome
- E. Histone - 30 nm fiber - 300 nm fiber (Looped domain) – Nucleosome – metaphase chromosome

40) Label each of leading and lagging strands:



Answers:

1	E	14	C	27	B
2	A	15	A	28	C
3	A	16	C	29	B
4	E	17	B	30	B
5	C	18	B	31	C
6	A	19	C	32	A
7	A	20	D	33	A
8	C	21	E	34	B
9	A	22	C	35	C
10	B	23	D	36	C
11	B	24	B	37	C
12	A	25	C	38	C
13	B	26	C	39	A

لولا المشقة ساد الناس كلهم ** الجود يفر والإقدام قتال

CH 17 :

- 1) During normal translation, where would you expect to find tRNA attached to single amino acid?
 - A. E site
 - B. P site
 - C. A site
 - D. Both E and P
 - E. Both A and P

- 2) The enzyme that is responsible for transcription is:
 - A. DNA polymerase I
 - B. DNA polymerase III
 - C. DNA polymerase II
 - D. RNA polymerase I
 - E. RNA polymerase II

- 3) What is a ribozyme?
 - A. A mutated ribosome
 - B. An RNA with enzymatic activity
 - C. A DNA sequence near the promoter that assists in the binding of RNA polymerase
 - D. A biological catalyst consisting of DNA
 - E. An enzyme that holds open the DNA double helix while RNA polymerase adds nucleotides

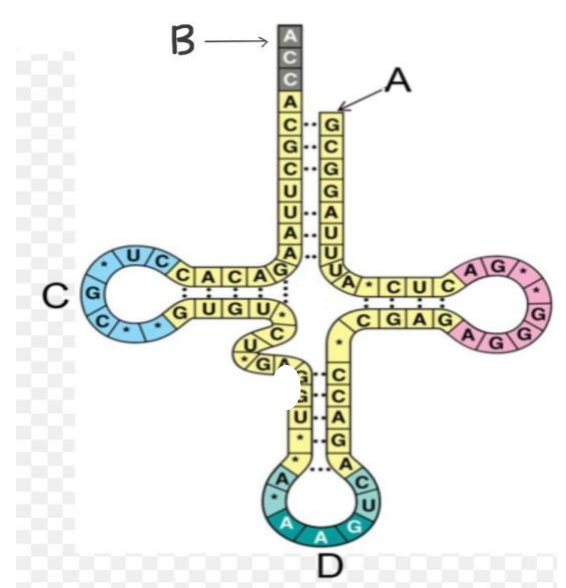
- 4) Aminoacyl-tRNA synthetases:
 - A. Binds the correct amino acid to the empty tRNA
 - B. Binds the tRNA to the anticodon
 - C. Binds the amino acids together
 - D. Binds the tRNA to the mRNA
 - E. Cuts and assemble the tRNA molecule

- 5) Which of the following best describes the definition of a gene?
- A. Region of DNA produces polypeptide or RNA
 - B. A section of DNA that produces a single protein product
 - C. The protein product that genetic material produces
 - D. A collection of polypeptides that fold to form a complex protein
 - E. Once genes are turned on in human cells, they cannot be turned off
- 6) Transcription in eukaryotes requires which of the following in addition to RNA polymerase?
- A. The protein product of primer
 - B. Start and stop codons
 - C. Ribosomes
 - D. Transcription factors
 - E. Aminoacyl synthetase
- 7) Once transcribed, eukaryotic mRNA typically undergoes alterations that include:
- A. Union the ribosomes
 - B. Fusion into circular forms known as plasmid
 - C. Linkage to histone molecules
 - D. Excision of introns
 - E. Fusion with other newly transcribed mRNA
- 8) What kind of molecules can be transcription factors?
- A. DNA and RNA
 - B. RNA and proteins
 - C. Proteins
 - D. Lipids
 - E. Lipids and carbohydrates

"سَدِّدُوا وَقَارِبُوا، وَاغْدُوا وَرُوحُوا، وَشَيْءٌ مِنَ الدَّلْجَةِ،
وَالْقَصْدَ الْقَصْدَ تَبَلَّغُوا"
-رسول الله عليه الصلاة والسلام

9) The figure represents tRNA that recognizes and binds the amino acid phenylalanine. Which codon on the mRNA strand codes for this amino acid?

- A. UGG
- B. GUG
- C. UUC
- D. CUU
- E. CAU



10) Which letter represent the amino acid attachment site?

- A. A
- B. B
- C. C
- D. D
- E. None of the above

11) Which of the following components does not form part of the transcription initiation complex in eukaryotic promoter?

- A. TATA box
- B. Start point
- C. Transfer RNA
- D. Transcription factors
- E. RNA polymerase

12) The transcription factors can:

- A. Regulate the synthesis of DNA in response to a signal
- B. Regulate the release of calcium from the endoplasmic reticulum
- C. Compose the spliceosome which facilitates mRNA splicing
- D. Mediate the binding of RNA polymerase to the parental strand of DNA
- E. Facilitate the termination of the mRNA transcript

13) What is the coding segment of a stretch of eukaryotic DNA called?

- A. Introns
- B. Exons
- C. Codons
- D. Replicons
- E. None of the above

14) Which is the energy rich molecule required for the initiation of translation?

- A. ATP
- B. GTP
- C. CTP
- D. AMP
- E. Glucose

15) The enzyme responsible for removal of introns is:

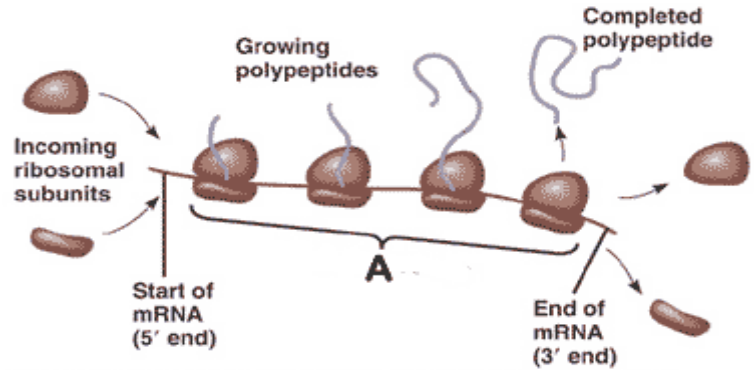
- A. Spliceosome
- B. Ligase
- C. Nuclease
- D. Ribozyme
- E. None of the above

16) SRP molecules function involve:

- A. Enhance the progress of translation by the ribosome
- B. Dock the ribosome onto Golgi apparatus membrane
- C. Arresting synthesis of a nascent membrane protein
- D. Targeting proteins to ER
- E. Acting as a chaperone

17) In the figure, letter A represents:

- A. Nucleosome
- B. Ribosome
- C. Spliceosome
- D. Polysome
- E. None of the above



18) In prokaryotic translation occur:

- A. Immediately as soon as transcription occur
- B. In the nucleus
- C. Only when cells are about to divide
- D. In more than one cellular location
- E. Translation does not occur in prokaryotic cells

19) What is polyribosome?

- A. A group of ribosomes reading single mRNA at the same time
- B. It produces multiple genes
- C. It produces one product that is alternatively spliced
- D. Molecule which removes introns
- E. It polymerizes ribosome synthesis

20) Which of the following is a function of a signal peptide?

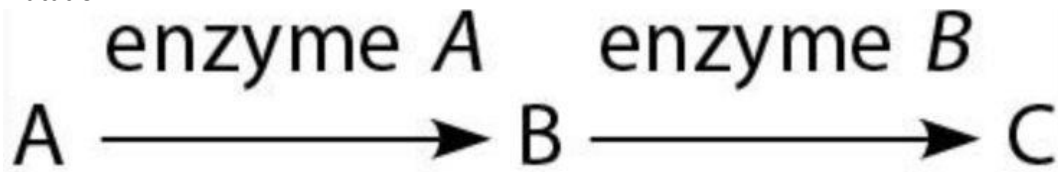
- a) To bind RNA polymerase to DNA and initiate transcription
- b) To signal the initiation of transcription
- c) To translocate polypeptides across the ER membrane
- d) To target the polypeptide to the ER
- e) To terminate translation of the messenger RNA

- 21) The correct flow of genetic information for making proteins in eukaryotic cell is:
- a) MRNA – Polypeptide – mRNA –DNA
 - b) MRNA – mRNA – Polypeptide –DNA
 - c) mRNA – MRNA – DNA –Polypeptide
 - d) DNA – mRNA – MRNA –Polypeptide
 - e) DNA – MRNA – mRNA –Polypeptide
- 22) The release factor:
- a) Degrades the mRNA transcript
 - b) Keeps the polypeptide chain attached to the ribosome
 - c) Keeps the ribosome attached to the mRNA
 - d) Does not look like an aminoacyl tRNA
 - e) Binds to the stop codon in the A site in place of tRNA
- 23) Which of the following is not true about signal recognition particle (SRP)?
- a) SRP binding to the ER signal sequence on a ribosome pauses translation
 - b) SRP is a protein-DNA complex
 - c) SRP receptor localizes on the ER membrane
 - d) An ER signal sequence and an SRP direct a ribosome to the SRP receptor on the ER membrane
 - e) SRP is not the protein translocator channel on the ER membrane
- 24) How many nucleotides are needed to code for a protein with 450 amino acids?
- a) 450×1
 - b) 450×2
 - c) 450×3
 - d) 450×4
 - e) We cannot determine

25) Sickle-cell disease is the result of which kind of mutation?

- A. Point mutation
- B. Silent mutation
- C. Missense mutation
- D. Nonsense mutation

26) A mutation results in a defective enzyme a. which of the following would result because of that mutation:



- A. an accumulation of A and no production of B and C
- B. an accumulation of A and B and no production of C
- C. an accumulation of B and no production of A and C
- D. an accumulation of B and C and no production of A
- E. an accumulation of C and no production of A and B

27) During elongation which site in the ribosome represents the location where a codon being read?

- A. E site
- B. A site
- C. P site
- D. The small ribosomal subunit
- E. mRNA binding site

لا يُستطاع العلم براحة الجسد

28) In eukaryote translation occur in:

- A. Centriole
- B. Centrosome
- C. Lysosome
- D. Cytoplasm

E. Nucleus

29) What is the effect of a nonsense mutation in a gene?

- A. It changes an amino acid in the encoded protein
- B. It has no effect on the amino acid sequence of the encoded protein
- C. It introduces a stop codon into the mRNA, causes translation to be terminated prematurely
- D. It alters the reading frame of the mRNA that prevents introns from being excised.

30) Frameshift mutations result from:

- A. Addition or deletion of nucleotides
- B. Introducing a stop codon into the mRNA, causes translation to be terminated prematurely
- C. Changing an amino acid in the encoded protein
- D. It has no effect on the amino acid sequence of the encoded protein

31) Which components not directly involved in translation:

- A. MRNA
- b. DNA
- C. RNA
- D. Ribosomes
- E. GTP

32) Change a codon to a stop codon is called:

- A. Missense mutation
- B. Nonsense
- C. Frame shift
- D. Thymine dimer

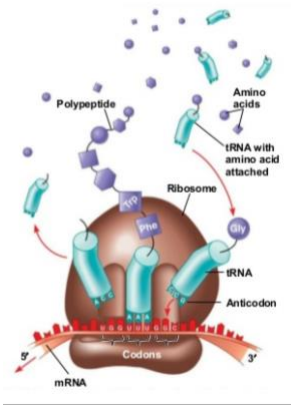
- 33) The 5' end of pre-mRNA is modified by addition of:
- A. A cap
 - B. An intron
 - C. An exon
 - D. Poly-A tail
 - E. Dose not modified
- 34) Which of the following protect mRNA from degradation?
- A. Poly-A tail
 - B. 5' cap
 - C. Introns
 - D. Exons
 - E. A and B only
- 35) which of the following synthesizes pre-mRNA in eukaryotic cells?
- A. RNA polymerase I
 - B. RNA polymerase II
 - C. DNA polymerase I
 - D. DNA polymerase II
 - E. DNA polymerase III
- 36) Once transcribed, eukaryotic mRNA typically undergoes alteration that includes:
- A. excision of introns.
 - B. fusion into circular forms known as plasmids.
 - C. linkage to histone molecules.
 - D. union with ribosomes.
 - E. fusion with other newly transcribed mRNA.

- 37) Of the following, which is the most current description of a gene?
- A. a unit of heredity that causes formation of a phenotypic characteristic
 - B. a DNA subunit that codes for a single complete protein
 - C. a DNA sequence that is expressed to form a functional product: either RNA or polypeptide
 - D. a discrete unit of hereditary information that consists of a sequence of amino acids
- 38) Processing of pre-mRNA into mRNA occur in:
- A. Cytoplasm
 - B. Cytosol
 - C. Nucleus
 - D. Nucleolus
 - E. None of the above
- 39) Which of the following is a stop codon?
- A. UAA
 - B. UGA
 - C. UAG
 - D. All of the above
 - E. None of the above
- 40) The start codon can be translated to:
- A. Thymine
 - B. Methionine
 - C. Guanine
 - D. None of the above

41) Which of the following is does not take place in nucleus?

- A. Transcription
- B. Assembly of ribosome
- C. Removing of introns
- D. Replication
- E. Translation

42) Label A, P and E sites of the ribosome.



بحسب ركوب الأحوال، واحتمال المشاق
والصعاب، تكون اللذة والفرح، فلا فرح لمن
لا هم له، ولا لذة لمن لا صبر له، ولا راحة
لمن لا تعب له، وكل ما فيه أهل النعيم المقيم
إنما هو صبر ساعة

Answers:

1	E	15	A	29	C
2	E	16	D	30	A
3	B	17	D	31	B
4	A	18	A	32	B
5	A	19	A	33	A
6	D	20	D	34	E
7	D	21	D	35	B
8	C	22	E	36	A
9	C	23	B	37	C
10	B	24	C	38	C
11	C	25	A	39	D
12	D	26	A	40	B
13	B	27	B	41	E
14	B	28	D		

ولم أجد الإنسان إلا ابن سعيه ** فمن كان أسعى كان بالمجد أجدرا