Biology for Health Professions

First Hour Exam

Instructors:

Name:……

Dr. Sameer.

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Student number:----------

Dr. Hatem

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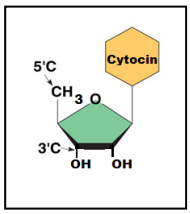
I. Select the most suitable choice (27 points):

1. **The structure shown in the figure is:**



   a. Monomer of DNA
   b. Monomer of RNA
   c. Nucleotide
   d. Nucleoside

2. **The nucleic acid backbone structure is made from**
   a. Sugar and phosphate
   b. Ribose and phosphate
   c. Deoxyribose and nitrogen bases
   d. Nitrogen bases and phosphate

3. **The base pairing in DNA is usually**
   a. Purine and purine
   b. Pyrimidine and pyrimidine
   c. (a) and (b)
   d. Purine and Pyrimidine

4. **Translation means:**
   a. Copying DNA to mRNA
   b. Copying mRNA to DNA
   c. Production of proteins from DNA
   d. Production of proteins from mRNA

5. **One of the most important features of lipids is:**
   a. It has polar bonds
   b. It can form hydrogen bonds with water
   c. It is hydrophobic
   d. It is hydrophilic

6. **Oils are liquid fats at room temperature because they are:**
   a. saturated
   b. unsaturated
   c. hydrophilic
   d. hydrophobic

7. **In fats, fatty acids are connected by ester linkage to:**
    a. Ribose
    b. Deoxyribose
    c. Glucose
    d. Glycerol
8. **Fats are important Stores of:**
    a. Amino acids
    b. Energy
    c. Sugars
    d. Genetic information
9. **Cholesterol is important in :**
    a. Formation of Lipid Membranes
    b. Steroid Hormones
    c. Cardiovascular diseases
    d. All the above
10. **The scientific method includes several steps. These steps can be ordered in the following order:**
    a. Observations > forming hypothesis > theory
    b. Observations > theory > forming hypothesis
    c. Theory > observations > hypothesis
    d. Theory > Observations > forming hypothesis
11. **Which of the following is <u>a trace element</u> in the human body:**
    a. Oxygen
    b. Hydrogen
    c. Carbon
    d. Iron
    e. Nitrogen
12. **The unique behavior of water is due to**
    a. Its chemical structure
    b. Interaction of water molecules together
    c. Its ability to form covalent bonds with solutes dissolved in it
    d. Both a and b
    e. Both a and c
13. **Water is**
    a. A universal solvent
    b. A versatile solvent
    c. An organic solvent
    d. All of the above

14. A buffer is

a. A weak acid and its corresponding base that resist changes in pH
b. A weak acid and its corresponding base that prevents changes in the pH
c. A strong acid and its corresponding base that resist changes in pH
d. A weak acid and its corresponding base that prevents changes in the pH

15. Isomers that are mirror images of each other are called

a. Structural isomers
b. Geometric isomers
c. Enantiomers
d. Cis/trans isomers

16. Which of the following is <u>not</u> a polymer

a. Glycogen
b. Amylase
c. Triglycerides
d. Protein

17. Polymers

a. Are made of monomers linked together by hydrogen bonds
b. Are made of monomers linked together by covalent bonds
c. Are synthesized by a process called hydrolysis
d. Are broken down by a process called condensation reaction

18. Monosaccharides are classified based on

a. The number of carbon atoms in the carbon skeleton
b. The location of carbonyl group
c. Spatial arrangement around asymmetric carbon
d. All of the above

19. In disaccharide such as sucrose, glucose and fructose are linked together by

a. Glycosidic linkage
b. Hydrogen bonding
c. Ionic bond
d. All of the above

20. Triglycerides are made of

a. Three fatty acids esterified to a glycerol molecule
b. Three fatty acids esterified to a cholesterol molecule
c. Two fatty acids esterified to a glycerol molecule
d. Two fatty acids esterified to a cholesterol molecule

21. Two or more polypeptide work together as a protein are called

a. Primary structure level
b. Secondary structure level
c. Tertiary structure level
d. Quaternary structure level

22. About 25 of the 92 natural elements are known to be essential to life. Which four of these 25 elements make up approximately 96% of living matter?

a. oxygen, hydrogen, calcium, nitrogen
b. carbon, sodium, hydrogen, nitrogen
c. carbon, oxygen, phosphorus, hydrogen
d. carbon, hydrogen, nitrogen, oxygen

23. Compared with ^{12}C, the radioactive isotope ^{14}C has

a. two more electron
b. two more neutron
c. a different atomic number
d. two more proton

24. A single molecule of water, two hydrogen atoms are bonded to a single oxygen atom by

a. hydrogen bonds
b. ionic bonds
c. polar covalent bonds.
d. van der Waals interactions

25. Which type of bond must be broken for water to vaporize?

a. polar covalent bonds
b. hydrogen bonds
c. both hydrogen bonds and ionic bonds
d. ionic bonds

26. Which of these molecules is not formed by dehydration reactions?

a. water
b. protein
c. disaccharides
d. DNA

27. All can denature protein <u>except:</u>

a. Heat b. pH changes c. Salts d. cold

II. True (T) or False (F)

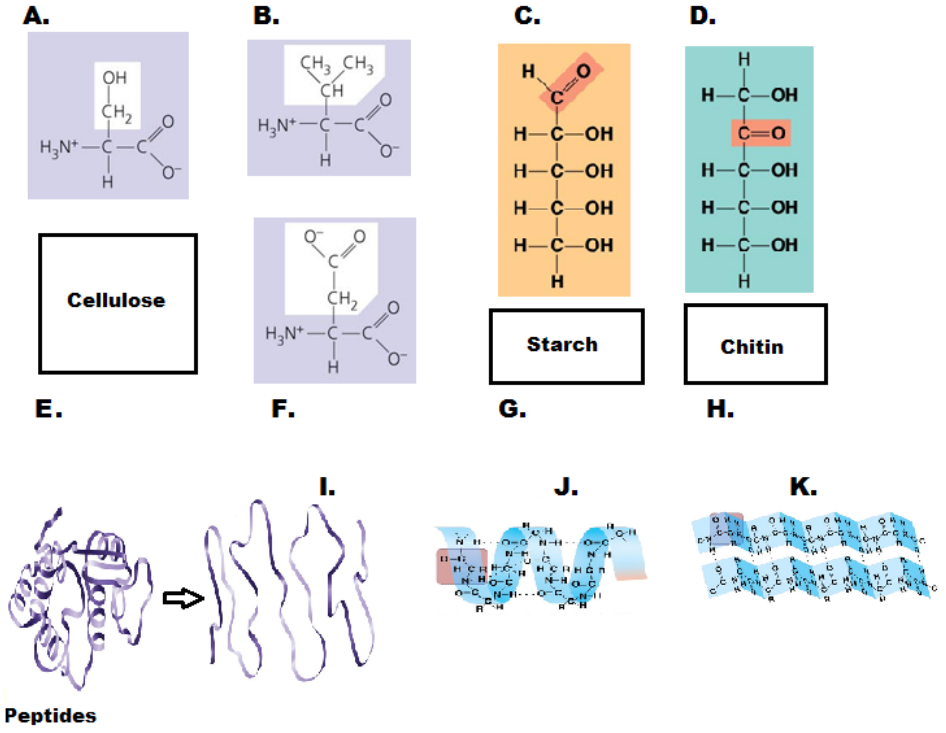
Mark each statement as T for true correct statements or F if statement is false (7 Points)

1	**T**	**F**	All proteins have a primary structure
2	T	F	All plant oils are healthy
3	T	F	Phospholipids are amphypathic molecules
4	T	F	Unsaturated plant fats exist as oils at room temperature
5	T	F	All fish will be frozen if ice had the same density as water
6	T	F	All proteins will have quaternary structures
7	T	F	Hydrogen bonding is a result of hydrophobic interaction of water molecules

8	T	F	Peptides are made from amino acids connected by ester bonds
9	T	F	Phosphodiester linkage are characteristic of tertiary protein structures
10	T	F	The high specific heat of water moderates the climate
11	T	F	The primary structure of polypeptides is determined by genes
12	T	F	Protein folding is correctly accomplished by shaperonin
13	T	F	Ice floats on water because it has more H-bonds than in water
14	T	F	Water high specific heat is due to its small molecules

III. Match each structure or word in the figure with its correct description from the table, putting the Letter in the provided space (11 points).

β-Sheet ---K----	polymer of α-glucose ----G----	polymer of N-acetylglucosamine ----H-----	polymer of β-glucose ----E----
Ketose ---D---	Denatured protein ---I----	Charged amino acid ---F-----	Polar amino acid ----A----
α-helix --J-----	Aldose ---C-----	Quaternary protein ---------	Hydrophobic amino acid ----B----



IV. Name the numbered bonds/forces shown on the figure below (3 points)

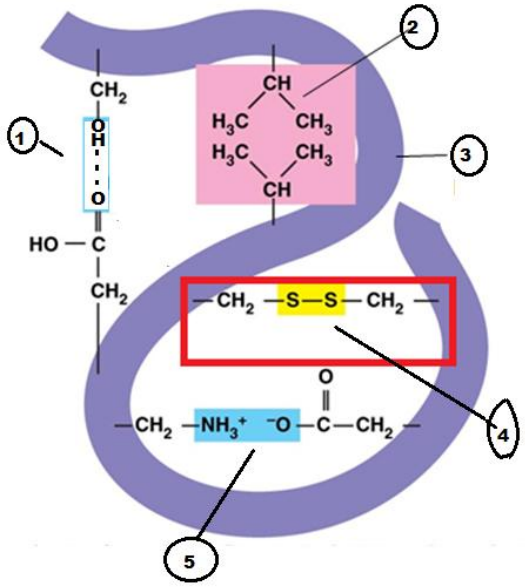
1.__Hydrogen bond ___

2.____Hydrophic bond __

3.____Amino acid ____

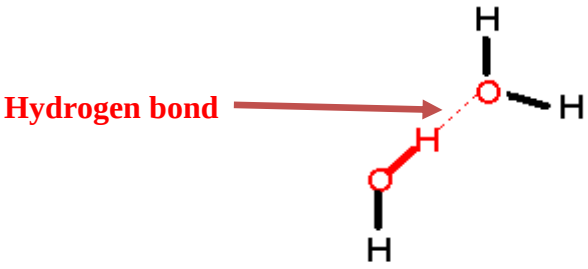
4.____Disulfide bridge_

5.____Ionic bond___



V- Short Questions:

1. **Draw hydrogen bonding between water molecules (2 points)**



2. **Give an example of emergent properties (2 points)**
   The edible salt (NaCl) is an emergent property with respect to the sodium (Metal) and chlorine (poisonous gas) of which it is composed. OR Any Relevant Answer

Good Luck