Practice MCQ For Govt Pharmacist Exam, in this article we will solve, Practice MCQ on the **UNIT I under the subject Biochemistry** of second semester. Read following article for your reference.

Introduction To Biomolecules » PHARMACAREERS

Carbohydrates: Introduction, Classification, Chemical Nature And Biological Importance » PHARMACAREERS

Lipids: Classification, Chemical Nature And Biological Importance » PHARMACAREERS

Proteins: Classification, Structure, Chemical Nature And Biological Importance Of Proteins » PHARMACAREERS

Nucleic Acids: Structure, Classification And Biological Importance » PHARMACAREERS

Bioenergetics » PHARMACAREERS

**1. Which biomolecule is the primary source of energy for most cells?**

a) Protein

b) Carbohydrate

c) Lipid

d) Nucleic Acid

**2. DNA and RNA are classified as:**

a) Carbohydrates

b) Lipids

c) Nucleic Acids

d) Proteins

**3. The building blocks of proteins are:**

a) Monosaccharides

b) Fatty Acids

c) Amino Acids

d) Nucleotides

**4. Which type of carbohydrate is used for structural support in plants?**

a) Glucose

b) Fructose

c) Starch

d) Cellulose

**5. Phospholipids are a type of lipid found in:**

a) Cell membranes

b) Energy storage

c) Insulation

d) All of the above

**6. The function of mRNA in protein synthesis is:**

a) Store genetic information

b) Carry amino acids

c) Copy genetic information

d) Provide instructions for protein assembly

**7. The primary structure of a protein refers to:**

a) The folding of the polypeptide chain

b) The sequence of amino acids

c) The 3D shape of the protein

d) The interaction with other molecules

**8. Which amino acid has the simplest side chain?**

a) Glycine

b) Tyrosine

c) Arginine

d) Tryptophan

**9. Enzymes are biological catalysts made primarily of:**

a) Carbohydrates

b) Lipids

c) Proteins

d) Nucleic Acids

**10. The complementary pairing between adenine (A) and uracil (U) occurs in:**

a) DNA-DNA bonding

b) DNA-RNA bonding

c) RNA-RNA bonding

d) All of the above

**11. Which term refers to the usable energy available in a system for cellular processes?**

a) Enthalpy (ΔH)

b) Entropy (ΔS)

c) Gibbs Free Energy (ΔG)

d) Redox Potential (E°)

**12. A reaction with a negative ΔG is considered:**

a) Endergonic and requires energy input

b) Endergonic and releases energy

c) Exergonic and requires energy input

d) Exergonic and releases energy

**13. Which equation relates free energy change (ΔG) to enthalpy change (ΔH) and entropy change (ΔS) at constant temperature?**

a) $\Delta G = \Delta H - T\Delta S$

b) $\Delta G = \Delta H + T\Delta S$

c) $\Delta S = \Delta G / \Delta H$

d) $\Delta H = \Delta G \times T\Delta S$

**14. Entropy (ΔS) is a measure of:**

a) Heat absorbed or released

b) Disorder or randomness in a system

c) Strength of chemical bonds

d) The rate of a reaction

**15. In cellular respiration, the electron transport chain is an example of:**

a) An endergonic reaction requiring ATP input

b) An endergonic reaction releasing energy

c) An exergonic reaction requiring ATP input

d) An exergonic reaction releasing energy through a series of redox reactions

**16. A higher positive redox potential (E°) indicates:**

a) A stronger tendency to lose electrons (reducing agent)

b) A weaker tendency to lose electrons (reducing agent)

c) A stronger tendency to gain electrons (oxidizing agent)

d) A weaker tendency to gain electrons (oxidizing agent)

**17. Standard hydrogen electrode (SHE) has a defined redox potential of:**

a) 0 V

b) +1.0 V

c) -0.1 V

d) It varies depending on the reaction

**18. The movement of electrons in redox reactions is directly coupled to:**

a) ATP synthesis

b) Protein synthesis

c) DNA replication

d) All of the above (depending on the cellular process)

**19. Which molecule readily accepts electrons and protons in the electron transport chain?**

a) Oxygen ($O_2$)

b) Carbon dioxide ($CO_2$)

c) Glucose ($C_6H_{12}O_6$)

d) Water ($H_2O$)

**20. Coupling exergonic reactions to endergonic reactions in a cell allows for:**

a) Increased entropy

b) Violation of the second law of thermodynamics

c) Overall energy transfer and cellular work

d) Spontaneous conversion of all energy into usable forms

**21. Energy-rich compounds are characterized by the presence of:**

a) Strong covalent bonds

b) Weak phosphodiester bonds

c) High-energy phosphate bonds

d) Peptide linkages

**22. Which of the following is NOT a common classification of high-energy compounds?**

a) Pyrophosphates

b) Acyl phosphates

c) Carbohydrates

d) Guanido phosphates

**23. The biological significance of ATP lies in its ability to:**

a) Store genetic information

b) Provide energy for cellular processes

c) Transport molecules across membranes

d) Act as a structural component of cells

**24. Cyclic AMP (cAMP) is derived from:**

a) Glucose

b) ATP

c) Amino acids

d) Nucleic acids

**25. The primary function of cAMP in cells is:**

a) Energy storage

b) Cellular signaling

c) Enzyme activation

d) All of the above (depending on the cellular context)

**26. The hydrolysis of ATP releases approximately how much free energy?**

a) -2 kcal/mol

b) -7.3 kcal/mol

c) -14.6 kcal/mol

d) -20 kcal/mol

**27. Compared to ATP, cAMP has:**

a) Higher energy content

b) Lower energy content

c) Identical energy content

d) No energy-storing ability

**28. The breakdown of glucose through cellular respiration ultimately leads to the production of:**

a) Only ATP

b) Only cAMP

c) Both ATP and cAMP

d) Neither ATP nor cAMP directly

**29. Which of the following statements about ATP is INCORRECT?**

a) It is the “universal currency” of cellular energy transfer.

b) It can be recycled through cellular respiration.

c) Its hydrolysis is an endergonic reaction.

d) It provides energy for a variety of cellular processes.

**30. Mutations in enzymes involved in cAMP signaling can lead to:**

a) Increased ATP production

b) Disrupted cellular communication

c) Enhanced protein synthesis

d) None of the above

**Answers**

1. Which biomolecule is the primary source of energy for most cells? **b) Carbohydrate**
2. DNA and RNA are classified as: **c) Nucleic Acids**
3. The building blocks of proteins are: **c) Amino Acids**
4. Which type of carbohydrate is used for structural support in plants? **d) Cellulose**
5. Phospholipids are a type of lipid found in: **a) Cell membranes**
6. The function of mRNA in protein synthesis is: **d) Provide instructions for protein assembly**
7. The primary structure of a protein refers to: **b) The sequence of amino acids**
8. Which amino acid has the simplest side chain? **a) Glycine**
9. Enzymes are biological catalysts made primarily of: **c) Proteins**
10. The complementary pairing between adenine (A) and uracil (U) occurs in: **b) DNA-RNA bonding**
11. Which term refers to the usable energy available in a system for cellular processes? **c) Gibbs Free Energy (ΔG)**
12. A reaction with a negative ΔG is considered: **d) Exergonic and releases energy**
13. Which equation relates free energy change (ΔG) to enthalpy change (ΔH) and entropy change (ΔS) at constant temperature? **a) ΔG = ΔH – TΔS**
14. Entropy (ΔS) is a measure of: **b) Disorder or randomness in a system**
15. In cellular respiration, the electron transport chain is an example of: **d) An exergonic reaction releasing energy through a series of redox reactions**
16. A higher positive redox potential (E°) indicates: **c) A stronger tendency to gain electrons (oxidizing agent)**
17. Standard hydrogen electrode (SHE) has a defined redox potential of: **a) 0 V**
18. The movement of electrons in redox reactions is directly coupled to: **a) ATP synthesis**
19. Which molecule readily accepts electrons and protons in the electron transport chain? **a) Oxygen (O2)**
20. Coupling exergonic reactions to endergonic reactions in a cell allows for: **c) Overall energy transfer and cellular work**
21. Energy-rich compounds are characterized by the presence of: **c) High-energy phosphate bonds**
22. Which of the following is NOT a common classification of high-energy compounds? **c) Carbohydrates**
23. The biological significance of ATP lies in its ability to: **b) Provide energy for cellular processes**
24. Cyclic AMP (cAMP) is derived from: **b) ATP**
25. The primary function of cAMP in cells is: **b) Cellular signaling**
26. The hydrolysis of ATP releases approximately how much free energy? **b) -7.3 kcal/mol**
27. Compared to ATP, cAMP has: **b) Lower energy content**
28. The breakdown of glucose through cellular respiration ultimately leads to the production of: **a) Only ATP**
29. Which of the following statements about ATP is INCORRECT? **c) Its hydrolysis is an endergonic reaction.**

30. Mutations in enzymes involved in cAMP signaling can lead to: **b) Disrupted cellular communication**