BIOLOGY PRACTICE TEST #2

1. **What is a cofactor?**
   a) A place where substrate attaches on enzyme
   b) Extra piece that makes an enzyme functional
   c) Place where substrate is altered
   d) When two enzymes come together to alter a single product

2. **Which describes quaternary protein organization?**
   a) Amino acid order
   b) α-helix and the β-pleated sheet folding
   c) 3D folding
   d) Multiple subunits

3. **An amino acid has an R group of CH_3. Which of the following will the methyl group make the amino acid?**
   a) Polar
   b) Acidic
   c) Basic
   d) Non-polar

4. **Which bonds contribute to α-helix's and β-pleated sheets?**
   a) Disulphide
   b) Covalent
   c) Hydrogen
   d) Ionic

5. **Which does NOT contribute to Protein denaturation?**
   a) Concentration of Salt
   b) High Chaperonin Concentration
   c) Heat and Agitation
   d) pH

6. **How are nucleic acid backbones bonded?**
   a) Peptide bonds
   b) Ester linkages
   c) Phosphodiester bonds
   d) Ether linkages

7. **What are the components of a nucleotide?**
   a) Base, Phosphate, Protein
   b) Base, Sulfate, Protein
   c) Phosphate, Protein, Sugar
   d) Base, Phosphate, Sugar

8. **Which correctly describes DNA structure?**
   a) Antiparallel
   b) Single helix
   c) -OH group on 3' carbon
   d) Has Uracil

9. **Which of the following is a purine?**
   a) Uracil
   b) Guanine
   c) Thymine
   d) Cytosine

10. **In what direction do you read DNA or RNA?**
    a) 5' to 3'
    b) 3' to 5'
    c) 3' to 2'
    d) 5' to 2'

11. Which of the following is not included in cell theory?

a) Viruses cannot be considered cells

b) All organisms are composed of cells

c) Cells only arise from preexisting cells

d) Cells are the smallest functional unit of life

12. Why is a high-surface area to volume ratio desirable?

a) More DNA storage

b) Increases protein folding

c) More evenly distributed nutrients

d) Less transport proteins

13. Which of the following can pass directly through the plasma membrane?

a) O_2 gas

b) Glucose

c) Ca^{2+}

d) Polar ligand

14. Which of the following is NOT found in all cells?

a) DNA and RNA

b) Ribosomes

c) Plasma membrane

d) Centrioles

15. A protein must go to the RER in order to be folded properly.

a) True

b) False

16. What are ribosomes made of?

a) A single protein unit

b) Two protein subunits

c) A single RNA unit

d) Two RNA subunits

17. Which of the following is NOT a function of the SER?

a) Stores proteins

b) Creates lipids

c) Stores Ca^{2+}

d) Metabolizes carbohydrates

18. Lysosomes are a product of which organelle?

a) RER

b) SER

c) Golgi

d) Peroxisomes

19. What is the function of the nuclear lamina?

a) Holds structure of nucleus

b) Delineates the nucleolus area

c) Helps mRNA escape nucleus

d) Creates pores in the nuclear envelope

20. Which is NOT a type of vacuole?

a) Central

b) Food

c) Contractile

d) Centrosome

21. What causes Tay Sachs disease?

a) Lack of certain enzyme in lysosomes to break down lipids in nerve cells

b) Too many lysosomes affect nervous system

c) Lack of lysosomes

d) Someone pissed of Apollo, bringer of plagues

22. Which organelles are the result of endosymbiosis?

a) Mitochondria and Golgi

b) Chloroplasts and Golgi

c) Mitochondria and Chloroplasts

d) Golgi and ER system

23. What are the inner foldings of Mitochondria called?

a) Cytochromes

b) Cisternae

c) Lumens

d) Cristae

24. Why are Mitochondria important in apoptosis?

a) They release caspases

b) They undergo necrosis

c) They release Cytochrome-C which activates caspases

d) KHAAAAAN!!!

25. Difference between Lysosomes and Peroxisomes?

a) L: destroy many things, P: attacks lipids

b) L: attack only lipids, P: attacks only proteins

c) L: belongs to animals, P: belongs to plants

d) P: only attacks Mitochondria

26. Which enzyme is found in Peroxisomes?

a) Lactase

b) Amylase

c) Catalase

d) Protease

27. Microtubules facilitate which process?

a) Chromosome separation

b) Cytokinesis

c) Pseudopodic movement

d) Muscle movement

28. What are Microtubules made from?

a) α, β, γ subunits of actin

b) α, β subunits of actin

c) α, β, γ subunits of tubulin

d) $\alpha, \beta,$ subunits of tubulin

29. All Eukaryotic cells have Centrioles.

a) True

b) False

30. What are the molecules that tell Microtubules where to form and when?

a) $NADP^+$

b) AMP

c) MAPs

d) Dynein

31. Motor proteins move along Microtubules in distinct directions based on which protein that attaches to them. Which is a correct statement? (Note: + direction is to membrane, - is from.)

a) Kinesian +, Dynein -

b) Dynein +, Kinesian -

c) Actin +, Tubulin -

d) None of the above

32. Eukaryotic Flagella/Cilia basal bodies and Centrioles share the same pattern of Microtubules. Which is it?

a) 3 sets of 9

b) 9 sets of 3

c) 9 sets of 2

d) 8 sets of 3

33. What is the arrangement of Microtubules in Flagella/Cilia "tails"?

a) 9 sets of 2

b) 9 sets of 3

c) 9 sets of 2, with 2 in middle

d) 9 sets of 3, with 2 in middle

34. Actin Filaments do NOT

a) Form when needed

b) Aid with pseudopodia

c) Separate chromosomes

d) Help contract muscles

35. Intermediate Filaments

a) Are temporary

b) Aid in Cytokinesis

c) Aid in cytoplasmic streaming

d) Are permanent

36. Lou Gehrig's Disease (Amylotrophic Lateral Sclerosis) is caused by defects in

a) Microtubules

b) Intermediate Filaments

c) Actin Fibers

d) ATP

37. The Cytoskeletal Cortex is

a) The 3D network formed by Microtubules

b) The 3D network formed by intermediate filaments

c) The 3D network formed by Microfilaments

d) The Centrosome

38. Plasmodesmata are

a) Thickened cell walls

b) A second plasma membrane

c) Cytoplasmic connections in plants

d) A plant organelle

39. Integrins are

a) On the inside of the plasma membrane

b) Receptor proteins that bind to Extracellular Matrix glycoproteins

c) Proteins that tighten up phospholipids

d) Lipids

40. Proteins associated with the inner membrane are NOT

a) Polar

b) Made in the RER

c) Made from free Ribosomes

d) Attached to phospholipids

41. Integral Transmembrane Proteins

a) Are mostly polar
b) Often contain a-helixes in non-polar regions
c) Interact directly with Ribosomes
d) Have only an N-terminus

42. Clatherins

a) Form vesicles in receptor-mediated endocytosis
b) Activate non-receptor-mediated phagocytosis
c) Direct vesicles to the cell membrane
d) Are extracellular

43. Integrins and Cadherins are used in

a) Necrosis
b) Cell structure
c) Cell division
d) Anchoring the cell to a substrate or another cell

44. A polar ion sits outside a cell in a high concentration (_____ solution). It needs to enter the cell which has a lower concentration. It requires _____.

a) Hypotonic; Active Transport
b) Hypertonic; Simple Diffusion
c) Hypertonic; Facilitated Diffusion
d) Hypotonic; Facilitated Diffusion

45. A transport protein pushes two molecules against their concentration gradients in the same direction. This is an example of a

a) Uniporter
b) Symporter
c) Antiporter
d) Metaphor for a romantic-comedy plot device

46. An electrical charge across a membrane is called

a) Membrane Potential
b) Ion Potential
c) Polar Potential
d) Tesla Potential

47. A tissue that has a layer of thin, flat cells is

a) Stratified Columnar Epithelia
b) Cuboidal Epithelia
c) Simple Squamus Epithelia
d) Stratified Squamus Epithelia

48. An Endergonic reaction is spontaneous and has negative ΔG.

a) True
b) False

49. A reaction uses the energy released from another reaction to fuel itself. This is called

a) Pairing
b) Antienergenic
c) Sympenergenic
d) Coupling

50. Which of the following is NOT a way enzymes lower E_A?

a) Orienting substrates correctly
b) Fueling on Exergonic reactions nearby
c) Straining substrate bonds
d) Providing a favorable microenvironment

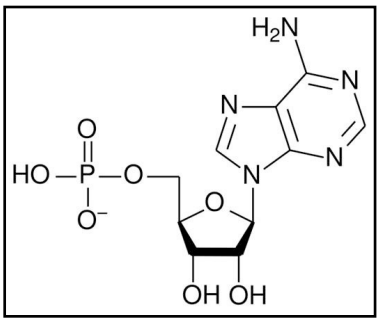
Simple Responses

1) **What makes the strongest bonds in tertiary structure?**

2) **Match up the Nucleotide base pairs (including Uracil).**

3) **How many bases are there in a codon?**

4) **What base in this? Is it a purine or pyrimidine? Why?**



5) **Identify the 3' end in the above image.**

Short Answers

1) What is the difference between Cytoplasm and the Cytosol?

2) Draw a basic amino acid model.

3) What is the difference between a polypeptide and a protein?

4) What does “Antiparallel” mean?

5) What are the functions of nucleic acids?

6) Name the components of the Endomembrane system.

7) Name the functions of the Golgi body.

8) What is the function of the “sugar tag”?

9) What are the six functions of membrane proteins?

10) What are the first and second laws of Thermodynamics?

11) What is the difference between “Anabolic” and “Catabolic”?

Essay Questions

1) List the steps and methods of Cell Fractionation

2) Describe the journey of a protein from the nucleus to its final location and form. Assume its final destination is the plasma membrane, that it's not fully ready by the time it enters the Golgi, and mention how it ends up in the membrane, not the extracellular fluid. (Mention tRNA, Cis vs. Trans Golgi, and how proteins move through the Golgi body.). You can make it list format.

3) Describe Endosymbiosis and the supporting evidence

4) Explain how the Sodium-Potassium pump works. Include the number of ions being transported.