Study Guide for Midterm 1

1. Monosaccharides – glucose, fructose, galactose
   Disaccharides – sucrose, maltose, lactose
   Polysaccharides – starch (rice), glycogen (animals), cellulose (plants)

2. Hypotonic – cytolysis = "pop", hemolysis = red blood cell popping
   Hypertonic – plasmolysis = "shrink", crenation = red blood cell shrinking
   Isotonic – nothing happens (in equilibrium)

3. Smooth Endoplasmic Reticulum (ER) – lipid synthesis
   Rough Endoplasmic Reticulum (ER) – makes proteins for export or membrane proteins
   Mitochondria – powerhouse of the cell
   Cilia – locomotion
   Flagella – locomotion
   Chloroplasts – contains chlorophyll, the pigment needed for photosynthesis
   Leucoplasts – starch storage bodies in plants
   Microfilaments – provide strength and support
   Lysosomes – suicide bags or sacks; digest bacteria and "foreign" material
   Microtubules – used in cells division and cell movement
   Golgi complex – three segments of Golgi complex (cis→medial→trans)
   Cuts proteins and adds carbohydrates,
   Packaging and shipping centers of the cell

4. Electrons = atomic number; negatively charged particle
   Protons = atomic number; positively charged particle
   Neutrons = atomic mass-atomic number; neutral charge
   Atomic number – equal to the number of proton and electrons for that atom
   Atomic mass – how much an atom weighs
   Atomic model structure –

5. Ions – charged atoms or molecules formed by the loss or gaining of electrons
   Cations (+) and Anions (-)

6. Proteins – made up of many amino acids
   Polysaccharides – complex combination of many sugars (carbohydrates)
   Fluid mosaic model – every cell membrane has a mixed combination of phospholipids, glycolipids, sterols, and proteins
   Cytoskeleton – composed of three main components: microfilaments, intermediate filaments, and microtubules

7. Diffusion – the passive movement of materials from an area of greater concentration to an area of lesser concentration
   Osmosis – diffusion of water across a selectively permeable membrane from an area of greater concentration to an area of lesser concentration
   Cytolysis – "popping"

Plasmolysis – "shrinking"
Phagocytosis – form of cell eating (large particles)
Peptide bond – forms as a condensation reaction joins the amino group of one amino acid and the carboxyl group of the next in line
pH = -log of the hydrogen concentration; a buffer is a substance that resists a change in pH
Acidity – pH 1-6.5
Neutral – pH 7
Basic – pH 7.5-14

8. Plant cells – organelles compressed toward outer edges of the cell, have chloroplasts, have a cell wall
Animal cells – organelles evenly distributed throughout cytoplasm

9. Integral proteins – imbedded within cell, very difficult if not impossible to remove
Transmembrane proteins – extends the entire length of the membrane
Peripheral proteins – loosely attached to the cell membrane on the inside or the outside
Transport proteins – allow the movement of materials into and out of the cell
Receptor proteins – receive a signal from outside the cell and pass it inside
Recognition proteins – display "self" signals to identify cells
Adhesion proteins – permit cell-cell junctions

10. Hooke – focused a microscope on thinly sliced cork and saw tiny compartments and named them "cells"
Leuwenhoek – looked at bacteria by scraping tartar off his teeth and examining it under a microscope

11. Active transport – requires energy, usually in the form of ATP, usually against a gradient
Passive transport – passive movement of materials from an area of greater concentration to an area of lesser concentration
Facilitated diffusion – diffusion across a membrane using a carrier molecule
Endocytosis – the movement of substance into the cell
Exocytosis – the removal of substances from within the cell
Phagocytosis – form of cell eating where large particles or cells are engulfed by the white blood cell
Contractile vacuoles – used by bacterium to remove internal water
Sodium/Potassium pump (Na+ / K+) – most famous active transport, 3 Na+ go out of cell while 2 K+ enter cell

12. Magnification

Eyepiece	Objective	
10X	4X	multiply together (10 x 4 = 40X

Resolution

R = (.61 / N.A.) x (λ)

N.A. = .1 and λ = 400nm

R = (.61 /.1) x (400nm) = 2400nm

13. Lactose Glucose Maltose Sucrose

Fat Steroid Fluid Mosaic Model

Nucleotide DNA (double helix) Amino Acid

14.

15. Enzymes – a type of protein that speeds up a chemical reaction
Substrates – a reactant molecule that is specifically acted upon by an enzyme
Enzyme optima – Enzymes require certain conditions for them to function correctly
pH effects on enzymes – pH is important to enzyme activity because it changes the SHAPE of the enzyme
Temperature effects on enzymes - Temperature is important to enzyme function because it changes the SHAPE of the enzyme