1. Define tissue __________________________________________________________

2. All tissues begin developing during the process of _______________________________
   Define gastrulation ______________________________________________________

3. Name the 3 primary germ layers (from outside to inside) __________________________

4. What tissues develop from each of these layers?
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

5. What tissue type comes from all 3 germ layers? _________________________________

6. Give a general description of the 4 types of tissues:
   Epithelial _____________________________________________________________
   Connective  ____________________________________________________________
   Muscle _______________________________________________________________
   Nervous  ______________________________________________________________

7. Name and describe the two surfaces of epithelial cells. ___________________________
   ______________________________________________________________________

8. Describe the specialized contacts between cells.
   Gap junctions ______________________________________________________
   Tight junctions ______________________________________________________
   Desmosomes ______________________________________________________
   Hemidesmosomes _____________________________________________________

9. Epithelial tissue is avascular. It _____________ (does or does not) have blood vessels.
   How does it get oxygen and nutrients? ______________________________________

10. Epithelial tissues is innervated. It _____________ (does or does not) have nerves.

11. Describe it's ability to regenerate. ___________________________________________

12. Describe the layers.
   Simple __________________________________________________________________
   Stratified __________________________________________________________________
13. Describe the shape of the cells.
   - Squamous
   - Cuboidal
   - Columnar

14. List functions of these epithelial tissues and give an example.
   - Simple squamous epithelium
   - Simple cuboidal epithelium
   - Simple columnar epithelium
   - Pseudostratified columnar epithelium
   - Stratified squamous epithelium
   - Stratified cuboidal epithelium
   - Stratified columnar epithelium

15. What is the function of goblet cells?

16. What is the function of microvilli?

17. What is the function of cilia?

GLANDS

18. Compare endocrine and exocrine glands.
   - Endocrine
   - Exocrine

19. Sweat glands are __________________ (endocrine or exocrine) glands.

20. __________________ glands release sensible sweat by exocytosis.
   - What is the function of sensible sweat?
   - What other substances are released by these glands?
21. _________________ glands release insensible sweat by shedding some of the cell’s cytoplasm along with the product being secreted.

   Describe insensible sweat. ____________________________________________________
   Why can this be called “smelly sweat”?

22. _________________ glands release oil when the cell ruptures.

   These are also called _______________ glands.

   Name some areas where oil is secreted. ________________________________________

23. Secretion of milk from mammary glands involves which 2 modes of secretion?

   ______________________________________
1. Groups of cells that have a similar structure and perform a related function.
2. gastrulation; development of 3 primary germ layers
3. ectoderm; mesoderm; endoderm
4. ectoderm (epithelium, nervous system, eyes); mesoderm (epithelium; muscles; connective tissue); endoderm (epithelium)
5. epithelium
6. Epithelial - covers and lines; forms boundaries between different environments; forms glands
   Connective - support and protection; holds organs together, stores fat for energy, immunity against disease
   Muscle - contraction causes movement of body and things in body
   Nervous - conducts electrical impulses from one part of body to another
7. Apical: exposed to exterior of body or cavity inside organ or ducts; some have microvilli or cilia
   Basal: next to basal lamina; cells that migrate to repair wounds begin here
8. tight junctions - keep cell from leaking; water resistant
   gap junctions - communication between cells when chemicals move from cell to cell
   desmosomes - strong; hold skin together
   hemidesmosomes - adhere cell to basement membrane
9. does not; diffusion from nearby connective tissue
10. does
11. has a high mitotic rate; replaces cells easily
12. simple - one layer; stratified - many layers
13. squamous - flat; cuboidal - shaped like a box; columnar - taller than wide
14. simple squamous - diffusion of gases in lungs, secretion of serous fluid in membranes, absorption of water
   simple cuboidal - secretion and absorption of substances in kidney tubules; secretion from glands
   simple columnar - secretion of mucus and other substances in stomach and large intestine;
     absorption of nutrients in small intestine
   pseudostratified columnar - secretion of mucus in respiratory tract; protection
   stratified squamous - protection against abrasion and chemicals
   stratified cuboidal - secretion in sweat and mammary glands
   stratified columnar - protection of pharynx, urethra, salivary gland ducts
   transitional - stretches and recoils as bladder fills and empties
15. secrete mucus
16. absorption (found on cells in small intestine)
17. movement of mucus (found on cells in respiratory tract)
18. endocrine - release hormones into extracellular fluid; taken up into capillaries and distributed in the blood
   exocrine - releases various substances (sweat, mucus, saliva) into ducts onto inner or outer surfaces of organs
19. exocrine
20. merocrine; temperature regulation - cools body; digestive enzymes and saliva
21. apocrine; loss of water through skin because the skin is not waterproof; bacteria grow on skin
22. holocrine; sebaceous; skin and hair follicles
23. merocrine and apocrine