Study Guide – Exam 3

1) **Know the following terms:** cephalization, parthenogenesis, blastopore, gastrulation, mesoderm, medusa, scolex, endoderm, heterotroph, polyp, ectoderm, choanocyte, spicule, osculum, cnidocyte, radula, mantle, torsion, nematocyst, hemoglobin, artery, vein, bronchus, erythrocyte, leukocyte, platelet, vein, capillary, arteriole, venule, trachea, alveoli(us), bicuspid, tricuspid, atrium, ventricle, aorta, pulmonary vein, pulmonary artery, inferior (posterior) vena cava, superior (anterior) vena cava, bronchiole, endothermy, marsupium, amniote egg, tympanum, proglottid, incomplete metamorphosis, complete metamorphosis, anapsid, diapsid, synapsid, hemolymph, blood, lymph, systole, diastole, tidal volume, vital capacity, residual volume
2) Provide your best **definition** of an **animal. "An animal is….(finish the statement)."**
3) Know the following taxonomic groups (specifically, the types of animals in each group and the **basic** features/characteristics of each group): Echinodermata, Actinopterygii, Chondrichthyes, Cubozoa, Rotifera, Mollusca, Polyplacophora, Gastropoda, Bivalvia, Cephalopoda, Annelida, Hirudinea, Arthropoda, Chelicerata, Hexapoda, Chordata, Urochordata, Sarcopterygii, Urodela, Squamata, Mammalia, Primates, Anthropoidea, Hominoidia
4) Differentiate between the terms **acoelomate**, **pseudocoelomate**, and **coelomate**. Provide some examples of acoelomate, pseudocoelomate, and coelomate animals.
5) Compare **protostome** and **deuterostome** development. List the major differences.
6) What is **radial symmetry**? Which animals exhibit radial symmetry?
7) Which animals lack true tissues?
8) Describe **two ways** that most amphibians acquire oxygen from their environments.
9) Why are **monotremes** a unique group of mammals?
10) Why is **segmentation** very important in some animals? Provide some evidence of segmentation in humans.
11) How did the **Ecdysozoa** group get its name? (HINT: What is **ecdysis**?)
12) How did the **Lophotrochozoa** group get its name? (HINT: What is a **lophophore**? What is a **trochophore** larva?)
13) Provide **three** reasons why insects have been extremely successful as a group.
14) Why are sponges, in the Phylum Porifera, considered basal animals? How does a sponge make its living?
15) Why was the development of jaws a major breakthrough in the evolution of animals? What are **animals with jaws** called? Why was the development of appendages (fins) very important in the evolution of animals?
16) Describe some unique characteristics (including flight adaptations) of birds.
17) What are **marsupials**? How are they different from **placental mammals (= eutherians)**?
18) How are lizards and snakes different from amphibians? Compare their overall characteristics.
19) Describe the basic anatomy of a turtle?
20) Which of the apes is most closely related to humans?
21) Know all of these tissues types (their basic features/characteristics and functions): fibrous connective tissue, adipose tissue, bone tissue, loose connective tissue, blood, cartilage, smooth muscle, nervous tissue, skeletal muscle, cardiac muscle

22) What parts of the life cycle in most modern amphibians are dependent on water or very moist habitats?
23) How did the evolution of the **amniote egg** free **amniotes** from a dependence on standing water?
24) What key adaptations in mammals allow them to be active under many types of environmental conditions?
25) Know the general pathways of oxygenated and deoxygenated blood throughout the body of a human (and into and out of the heart). Know the ***major blood vessels*** that carry oxygenated blood and the ones that carry deoxygenated blood.
26) Which organisms have a single circuit of blood flow in their circulatory system? Which organisms have a double circuit?
27) What is a pulmocutaneous circuit? pulmonary circuit? systemic circuit? Where does each circuit deliver blood and for what purpose (or function)?
28) The superior vena cava returns _____ blood to the _____ atrium of the heart (fill in the blanks). (Be prepared for questions like this one.)
29) Where are blood cells produced in humans?
30) Distinguish between an **open circulatory system** and a **closed circulatory system**. Which one is more effective? Which one is more costly to maintain and why? Why do you think humans could not function with an open circulatory system?
31) When blood returns from the pulmonary circuit, it first enters which chamber of the heart? (Be prepared for questions like this one.)
32) List some organisms that **lack** a circulatory system.
33) What is the purpose of valves in the heart?

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34) Actual gas exchange occurs through the walls of which type of vessel?
35) Describe how humans inhale and exhale air (i.e., the processes of inhalation and exhalation).
36) List the disadvantages of using **water** as a **respiratory medium (versus air)**?
37) Explain the role of hemoglobin in gas exchange. Include two important functions of hemoglobin ***in addition*** to its primary function. Be sure to describe the processes by which hemoglobin **binds to oxygen** at the lungs and then **releases the oxygen** at body tissues and organs.
38) Why would you want a respiratory surface that is moist and with a lot of surface area?
39) How does **countercurrent exchange** optimize gas exchange across fish gills?
40) Where does gas exchange specifically occur in mammalian lungs, and how does it occur (describe the process)?