Exam 2 Review

1) Which of the following is **incorrectly** paired with a digestive enzyme?

A) Sucrase – salivary glands

B) Carboxypeptidase – pancreas

C) Trypsin – pancreas

D) Lactase – intestinal glands

2) Some nutrients are considered "essential" in the diets of certain animals because

A) only those animals use the nutrients.

B) they are subunits of important polymers.

C) they cannot be manufactured by the organism.

D) they are necessary coenzymes.

E) only some foods contain them.

3) Which of the following is true of bile salts?

A) They are enzymes in the stomach.

B) They are manufactured by the pancreas.

C) They emulsify fats in the small intestine.

D) They increase the efficiency of pepsin action.

E) They are normally an ingredient of gastric juice.

4) Humans can lose, but cannot gain, heat through the process of

A) conduction.

B) convection.

C) radiation.

D) evaporation.

E) metabolism.

5) The pH of the gastric juice of the stomach is 2 due to HCL formation. Where does this formation of HCl occur?

A) in the chief cells of the stomach

B) in the parietal cells of the stomach

C) in the transformation of pepsinogen to pepsin

D) in the lumen of the stomach

E) in the secretions of the esophagus

6) Which of the following is correct for a blood pressure reading of 130/80?

I. The systolic pressure is 130.

II. The diastolic pressure is 80.

III. The blood pressure during heart contraction is 80.

A) I only

B) III only

C) I and II only

D) II and III only

E) I, II, and III

7) Hibernation and estivation are both examples of

A) acclimatization.

B) torpor.

C) evaporative cooling.

D) non-shivering thermogenesis.

E) shivering thermogenesis

Use graphs for questions 8-11.

Graph 1. **Relationship of BMR to body size** Graph 2.  **Relationship of BMR per kilogram of body mass to body size**

8) Which of the following will have an influence on metabolic rate?

A) Nutrition

B) Ectothermy or Endothermy

C) Size and Age

D) Only B & C are correct

E) All of the Above

9) From graph 1, the slope would suggest that

A) Smaller animals require more chemical energy

B) Larger animals have less body mass and therefore require less chemical energy

C) Metabolic rate is inversely proportional to body mass

D) More body mass requires more chemical energy

E) A & B are correct.

10) From graph 2, a mouse uses \_\_\_\_\_\_ energy per kilogram of body weight compared to an elephant, therefore in smaller animals the rate of energy use per cell is \_\_\_\_\_\_\_ than that in larger animals.

A)less, more

B) less, greater

C) less, less

D) more, less

E) more, greater

11) Reading graphs 1 & 2 would suggest that as body size increases in animals, there is

A) a decrease in the surface-to-volume ratio.

B) no further reproduction in aqueous environments.

C) the tendency for larger bodies to be more variable in metabolic rate.

D) an increase in migration to tropical areas.

E) an increase in the surface-to-volume ratio.

12) Where are the bicuspid and tricuspid valves found in the mammalian heart?

A) where blood goes from atria to ventricles

B) on the right side of the heart only

C) where the pulmonary veins attach to the heart

D) at the places where blood leaves via the aorta and pulmonary arteries

E) at the places where the anterior and posterior venae cavae enter

13) . In which group of animals would you expect to find a relatively long cecum?

A) carnivores

B) herbivores

C) autotrophs

D) heterotrophs

E) omnivores

14) Endothermy

A) involves acquiring heat from your environment only.

B) involves production of heat through metabolism.

C) is a term equivalent to "cold-blooded."

D) is only seen in mammals.

E) is only seen in insects.

15) How does the digestion and absorption of fat differ from that of carbohydrates?

A) Processing of fat does not require any digestive enzymes, whereas the processing of carbohydrates does.

B) Fat absorption occurs in the stomach, whereas carbohydrates are absorbed from the small intestine.

C) Carbohydrates need to be emulsified before they can be digested, whereas fats do not.

D) Absorbed fat enters the lymphatic system, whereas carbohydrates directly enter the blood.

E) Only fat must be worked on by bacteria in the large intestine before it can be absorbed.

16) Myocardial ischemia is a disorder that comes from deprivation of oxygen and nutrients to the muscle tissues of the heart. Clinical manifestations are usually a type of chest pain called angina. What component of the heart is most likely responsible for these symptoms?

A) Superior vena cavae

B) Pulmonary artery

C) Right atrium

D) Left ventricles

E) Coronary artery

17) In the mammalian heart, the right chambers of the heart pumps blood to the pulmonary circuit while the left chambers of the heart pump blood to the systemic circuit. This should suggest that…

A) The left chambers of the heart have thinner walls and lower blood pressure.

B) The right side of the heart pumps more blood than the left side.

C) The left side has more valves than the right side of the heart.

D) There is no difference in the anatomy of the left and right chambers of the heart.

E) The right heart is a low pressure system while the left heart is a thicker-walled high pressure

system.

18) Differences between blood pressure and Osmotic pressure drives…

A) Fluids into capillaries at the arterioles end

B) Fluids out of venule end into capillaries

C) Fluids out of capillaries at arteriole end

D) Fluids into capillaries at venule end

E) C & D are correct

19) Obesity, genetics factor, is usually visible in patients lacking the ability to know when they are full after a nice meal. Which hormone deficiency is most likely responsible for this disorder?

A) Ghrelin

B) Insulin

C) Glucagon

D) Leptin

E) B & C is correct

20) Cells possessing of MHC II are

A) Neutrophils, macrophages, B-cells

B) Eosinophils, Natural Killer cells

C) T-cells, B-cells, basophils

D) Macrophages, B-cells, dendritic cells

E) None of the above combinations are entirely correct

21) Which is NOT a characteristic of the innate immunity?

A) Very fast response

B) Stomach acid

C) Tears

D) 1 Antigen specific to 1 epitope

E) A & D are incorrect

22) A virus such as HIV destroys the body’s T-lymphocytes, to which type of disease would the patient be most susceptible?

A) Viral infections

B) Bacterial infections

C) Autoimmune diseases

D) Immunoglobulin deficiencies

E) C & D is correct

23) Which of the following is NOT involved in cell-mediated immunity?

A) Memory cells

B) Plasma cells

C) Cytotoxic cells

D) Suppressor cells

E) None of the above

24) Which of the following is singular to Flatworms?

A) Have a closed circulatory system

B) Have a single circulatory system

C) Have a double circulatory system

D) Have an open circulatory system

E) Have no circulatory system

25) When Hydrostatic pressure increases, occurs. And when hydrostatic pressure decreases results.

A) Vasodilation; vasoconstriction

B) Vasoconstriction; vasodilation

C) Vasoconstriction; fainting

D) None of the above match correctly

**NOTE**: For questions 26 - 32 use information below as reference.

**Bohr Shift equation**: CO2 + H2O ↔ H2CO3 ↔ HCO3- + H+

Graph 3. pH and Hemoglobin dissociation.

26) A vast majority of Carbon dioxide exist in the blood in the form of

A) H2CO3

B) HCO3-

C) CO3-

D) CO2

E) CO

27) Ventricular tachycardia (*v tach*) is a dangerous condition of elevated heart rate, about 200 beats per minute. Which of the following best explains why *v tach* is such a deathly condition if normal rhythm is not quickly restored?

A) The heart fills with blood during systole, so faster heart beat means less time there is for blood to enter the heart. A faster heart beat means diminishing returns in terms of amount of blood supplied to the body.

B) Damage to the SA node comes with aging, hence the *v tach* condition can only be found in the older population.

C) During period of rest or exercise the autonomic nervous system controls heart rate. Hence a *v tach* syndrome is due to a nervous disorder.

D) The *v tach* condition is evidence of cardiac input disorder.

E) The heart fills with blood during diastole, so faster heart beat means less time there is for blood to enter the heart. A heart with *v tach* cannot properly fill with blood and paradoxically stops pumping blood.

28) From question 27, when there is high energy demand leading to an elevated heart rate, the hemoglobin of a given patient suffering this condition will

A) Have allosteric effects due to less breathing cycles.

B) Experience an increased affinity for CO3-

C) Experience a reduced affinity for O2

D) Experience a reduced affinity for CO3-

E) More than one answer is correct.

29) When there is an in Carbon dioxide concentration in the blood, one would to see expect a in blood pH.

A) Decrease; decrease

B) Increase; decrease

C) Increase; increase

D) None of the above

30) Metabolic or respiratory disturbances can cause the pH to shift (acidosis) up or down (alkalosis), giving rise to potentially dangerous ad life threatening conditions. In the case of a patient suffering from Lactic Acid acidosis syndrome, in response to changing blood pH, respiratory rate may

A) Rise, in order to decrease the amount of CO2 gas being excreted.

B) Fall, in order to increase the amount of CO2 gas being excreted

C) Rise, in order to increase the amount of CO2 gas being excreted

D) Fall, in order to decrease the amount of CO2 gas being excreted

E) Rise, in order to maintain the amount of CO2 gas being excreted

31) Panting by an overheated dog is an example of

A) acclimatization.

B) torpor.

C) evaporative cooling.

D) non-shivering thermogenesis.

E) shivering thermogenesis.

32) The blood level of which gas is most important in controlling human respiration rate?

A) nitric acid

B) nitrogen

C) oxygen

D) carbon dioxide

E) carbon monoxide

33) Toll-like receptors are

A) pathogen associated molecular patterns found on microbes

B) pathogen associated molecular patterns found on fruit flys (*Drosophila melanogaster*)

C) pattern recognition receptors found on mammalian cells

D) pattern recognition receptors found on microbes

E) really cool receptors

34) At the venous end of a capillary bed, the osmotic pressure

A) Is greater than the hydrostatic pressure

B) Results in a net outflow of fluid

C) Results in a net re-absorption of fluid into the blood

D) A & C are correct

E) None of the above, more information is needed.

35) A sphygmomanometers measure the gauge pressure in the systemic circulation, which is the pressure above atmospheric pressure (760 mmHg at sea level). At what component of the circulatory circuit would one expect to detect the largest ***drop*** in blood pressure?

A) Arteries

B) Veins

C) Venules

D) Capillaries

E) Arterioles

36) \_\_\_\_\_\_\_\_\_ walls are three times thicker than \_\_\_\_\_\_\_\_ walls because blood is pumped at a higher pressure.

A) vein, artery

B) artery, vein

C) capillaries, artery

D) capillaries, vein

E) smooth muscle, cardiac muscle

37) Have Closed circulatory systems.

A) Insects

B) Sharks

C) Humans

D) B & C Only

E) All of the above.

38) These are all part of the innate immune system *except*

A) B lymphocytes

B) skin

C) macrophage

D) stomach acid

E) natural killer cells

39) If, during protein starvation, the osmotic pressure on the venous side of capillary beds drops below the hydrostatic pressure, then

A) hemoglobin will not release oxygen.

B) fluids will tend to accumulate in tissues.

C) the pH of the interstitial fluids will increase.

D) most carbon dioxide will be bound to hemoglobin and carried away from tissues.

E) plasma proteins will escape through the endothelium of the capillaries.

40) The four characteristics of inflammation are

A) redness, swelling, numbness, pain

B) redness, swelling, heat, pain

C) swelling, cellular activation, fever, jaundice

D) redness, fever, heat, pain

E) pain, heat, jaundice, swelling

41) DiGeorge’s syndrome is a medical disorder in which diagnosed patients have a high deficiency of T-lymphocytes. Which organ’s underdevelopment or absence will result in this T-cell disorder?

A) Spleen

B) Bone marrow

C) Thymus

D) A & B are correct

E) Liver

42) These are the most abundant white blood cell in circulation, they only live 2-3 days.

A) macrophages

B) neutrophils

C) natural killer cells

D) mast cells

E) red blood cells

43) Compared with the interstitial fluid that bathes active muscle cells, blood reaching these cells in **arteries** has a

A) higher PO2.

B) higher PCO2.

C) greater bicarbonate concentration.

D) lower pH.

E) lower osmotic pressure.

44) Plasma cells are

A) effector B-cells which secrete antibodies

B) memory B-cells

C) effector T-cells which secrete antibodies

D) memory T-cells

E) cells that have never been exposed to pathogen

45) The epithelium type with the shortest diffusion distance is (hint: lungs)

A) simple squamous epithelium.

B) simple cuboidal epithelium.

C) simple columnar epithelium.

D) pseudostratified ciliated columnar epithelium.

E) stratified squamous epithelium.

46) Cytotoxic T-cells bind to while Helper T-cells bind to .

A) CD4 & MHC I; CD8 & MHC II

B) CD8 & MHC II; CD4 & MHI

C) MHC II & CD4; MHC II & CD8

D) MHC I & CD8; MHC II & CD4

E) Directly to bacteria; directly to viruses

47) Rheumatoid arthritis is

A) an immunodeficiency disease characterized by antibodies attacking synovial membranes lining the joints

B) an autoimmune disease characterized by antibodies attacking synovial membranes lining the joints

C) an autoimmune disease found predominantly in males

D) an autoimmune disease affecting the myeloid sheaths lining nerve axons

E) an autoimmune disease causing insulin resistance

48) Which of the following has been *INCORRECTLY* matched with its function?

A) IgM – neutralization, activates complement

B) IgA – secreted (present in tears, breast milk, saliva

C) IgE – most abundant in blood, fetal immunity

D) A & B only

E) IgD – role in development of immature B-cells

49) Which of the following is an example of Immune deficiency conditions?

A) Lupus

B) TYPE I diabetes

C) SCID

D) MS (multiple sclerosis)

E) RA (rheumatoid arthritis)

50) Basal Metabolic rate (BMR) refers to

A) Ectotherm metabolic rate at a specific temperature

B) Endotherm metabolic rate at a “comfortable” or “resting” temperature

C) The number of calories you burn after a long day’s work

D) The number of calories you’d burn if you stayed in bed all day. ☺

E) B & D are correct