Exam 2 SI REVIEW

Name:

54 questions; 35 minutes: GOOD LUCK!

1. Which statement best describes the difference in responses of effector B cells (plasma cells) and cytotoxic T cells?
   1. B cells confer active immunity; cytotoxic T cells confer passive immunity
   2. B cells kill viruses directly; cytotoxic T cells kill virus infected cells
   3. B cells secrete antibodies against a virus; cytotoxic T cells kill virus-infected cells.
   4. B cells accomplish the cell-mediated response; cytotoxic T cells accomplish the humoral response.
   5. B cells respond the first time the invader is present; cytotoxic T cells respond subsequent times
2. Which of the following is true of bile salts?
   1. They are enzymes in the stomach.
   2. They are manufactured by the pancreas.
   3. They emulsify fats in the small intestine.
   4. They increase the efficiency of pepsin action.
   5. They are normally an ingredient of gastric juice.
3. In which group of animals would you expect to find a relatively long cecum?
   1. carnivores
   2. herbivores
   3. autotrophs
   4. heterotrophs
   5. omnivores
4. Which of the following is **incorrectly** paired with a digestive enzyme?
   1. Sucrase – salivary glands
   2. Carboxypeptidase – pancreas
   3. Trypsin – pancreas
   4. Lactase – intestinal glands
5. Some nutrients are considered "essential" in the diets of certain animals because
   1. only those animals use the nutrients.
   2. they are subunits of important polymers.
   3. they cannot be manufactured by the organism.
   4. they are necessary coenzymes.
   5. only some foods contain them.
6. Humans can lose, but cannot gain, heat through the process of
   1. conduction.
   2. convection.
   3. radiation.
   4. evaporation.
   5. metabolism.
7. The pH of the gastric juice of the stomach is 2 due to HCL formation. Where does this formation of HCl occur?
   1. in the chief cells of the stomach
   2. in the parietal cells of the stomach
   3. in the transformation of pepsinogen to pepsin
   4. in the lumen of the stomach
   5. in the secretions of the esophagus
8. Which of the following is correct for a blood pressure reading of 130/80?
   * + 1. The systolic pressure is 130.
       2. The diastolic pressure is 80.
       3. The blood pressure during heart contraction is 80.
   1. I only
   2. III only
   3. I and II only
   4. II and III only
   5. I, II, and III
9. Hibernation and estivation are both examples of
   1. acclimatization.
   2. torpor.
   3. evaporative cooling.
   4. non-shivering thermogenesis.
   5. shivering thermogenesis
10. Which of the following is NOT true about helper T-cells?
    1. They function in cell-mediated and humoral responses
    2. They are activated by polysaccharide fragments
    3. They bear surface CD4 molecules
    4. They are subject to infection by HIV
    5. When activate, they secrete cytokines
11. Anorexia (orexia = appetite) is often a sign of malignancy or liver disease. Anorexia nervosa is loss of appetite caused by emotional problems such as anger, anxiety, and fear. It is an eating disorder and similar to bulimia nervosa. Assuming anorexia, and this is only assuming, it was a hormonal disorder, which of the following would be true?
    1. Unusual spike in Leptin hormone
    2. Unusual spike in PYY hormone
    3. Unusual spike in Insulin
    4. All of the above (a-c)
    5. Unusual spike in Ghrelin
12. Which of the following best follows the activation of Pepsinogen?
    1. Chief cell secrete pepsin, while parietal cells secrete H+ and Cl- separately, this forms pepsin in the lumen of the stomach which activates pepsinogen.
    2. Chief cell secrete H+ and Cl-, while parietal cells secrete pepsinogen, this forms pepsin in the lumen of the stomach which activates pepsinogen.
    3. Pepsinogen activation begins when form crosses the cardiac sphincter; parietal cell secretion acts more for enzymatic reasons, so as to reduce time of digestion in the stomach.
    4. Chief cell secrete pepsinogen, while parietal cells secrete HCl, this forms pepsin in the lumen of the stomach which activates pepsinogen.
    5. Chief cell secrete pepsinogen, while parietal cells secrete H+ and Cl- separately, HCl is then formed in the stomach converting pepsinogen to pepsin in the lumen of the stomach which in turn activates more pepsinogen.
13. HIV targets include all of the following except
    1. Macrophages
    2. Cytotoxic T cells
    3. Helper T-Cells
    4. Cells bearing CD4
    5. Brain cells
14. You are looking at a CT scan of the abdomen of a child who presented to you with various symptoms, including projectile vomiting. You notice a constriction in the digestive system that prevents food from reaching the small intestine. Which structure is the most likely site of the problem?

A) Cardiac sphinter

B) Ileum

C) Rectum

D) Pyloric sphincter

E) Jejunum

1. Which of the following is not a fat soluble vitamin?
   1. Vitamin D
   2. Vitamin C
   3. Vitamin A
   4. Vitamin K
2. An ectotherm is more likely to survive an extended period of food deprivation than would an equally-sized endotherm because
   1. the ectotherm maintains a higher basal metabolic rate.
   2. the ectotherm expends more energy/kg body weight than the endotherm.
   3. the ectotherm invests little energy in temperature regulation.
   4. the ectotherm metabolizes its stored energy more readily than can the endotherm.
   5. the ectotherm has greater insulation on its body surface.

**Use graphs for questions 17-20.**

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

1. Which of the following will have an influence on metabolic rate?
   1. Nutrition
   2. Ectothermy or Endothermy
   3. Size and Age
   4. Only B & C are correct
   5. All of the Above
2. From graph 1, the slope would suggest that
   1. Smaller animals require more chemical energy
   2. Larger animals have less body mass and therefore require less chemical energy
   3. Metabolic rate is inversely proportional to body mass
   4. More body mass requires more chemical energy
   5. A & B are correct.
3. 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

1. Reading graphs 1 & 2 would suggest that as body size increases in animals, there is
   1. a decrease in the surface-to-volume ratio.
   2. no further reproduction in aqueous environments.
   3. the tendency for larger bodies to be more variable in metabolic rate.
   4. an increase in migration to tropical areas.
   5. an increase in the surface-to-volume ratio.
2. Where are the bicuspid and tricuspid valves found in the mammalian heart?
   1. where blood goes from atria to ventricles
   2. on the right side of the heart only
   3. where the pulmonary veins attach to the heart
   4. at the places where blood leaves via the aorta and pulmonary arteries
   5. at the places where the anterior and posterior venae cavae enter
3. Endothermy
   1. involves acquiring heat from your environment only.
   2. involves production of heat through metabolism.
   3. Is a term equivalent to "cold-blooded."
   4. Is only seen in mammals.
   5. Is only seen in insects.
4. In negative pressure breathing, inhalation results from
   1. Forcing air from the throat down into the lungs
   2. Contracting the diaphragm
   3. Relaxing the muscles of the rib cage
   4. Using muscles of the lungs to expand the alveoli
   5. Contracting the abdominal muscles
5. 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?
   1. Spleen
   2. Bone marrow
   3. Thymus
   4. A & B are correct
   5. Liver
6. *ob gene* Obesity, a 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?
   1. Ghrelin
   2. Tenderosin
   3. Glucagon
   4. Leptin
   5. Eusinocarin
7. Which of the following animals in incorrectly paired with its feeding mechanism?
   1. Lion – substrate feeder
   2. Baleen whale – suspension feeder
   3. Aphid – fluid feeder
   4. Clam – suspension feeder
   5. Snake – bulk feeder
8. Which of the following organs is INCORRECTLY paired with its function?
   1. Stomach – protein digestion
   2. Oral cavity – starch digestion
   3. Large intestine – bile production
   4. Small intestine – nutrient absorption
   5. Pancreas – enzyme production
9. Which of the following has been *INCORRECTLY* matched with its function?
   1. IgM – neutralization, activates complement
   2. IgA – secreted (present in tears, breast milk, saliva
   3. IgE – most abundant in blood, fetal immunity
   4. IgD – role in development of immature B-cells
   5. A & B only
10. Differences between blood pressure and Osmotic pressure drives…
    1. Fluids into capillaries at the arterioles end
    2. Fluids out of venule end into capillaries
    3. Fluids out of capillaries at arteriole end
    4. Fluids into capillaries at venule end
    5. C & D are correct
11. Cells possessing of MHC II are
    1. Neutrophils, macrophages, B-cells
    2. Eosinophils, Natural Killer cells
    3. T-cells, B-cells, basophils
    4. Macrophages, B-cells, dendritic cells
    5. None of the above combinations are entirely correct
12. Fibroblasts secrete
    1. Fats
    2. Chondroitin sulfate
    3. Interstitial fluids
    4. Calcium phosphate for bone
    5. Proteins for connective fibers
13. A virus such as HIV destroys the body’s T-lymphocytes, to which type of disease would the patient be most susceptible?
    1. Viral infections
    2. Bacterial infections
    3. Autoimmune diseases
    4. Immunoglobulin deficiencies
    5. C & D is correct
14. Which of the following is NOT involved in cell-mediated immunity?
    1. Memory cells
    2. Plasma cells
    3. Cytotoxic cells
    4. Suppressor cells
    5. None of the above
15. Which of the following is singular to Flatworms?
    1. Have a closed circulatory system
    2. Have a single circulatory system
    3. Have a double circulatory system
    4. Have an open circulatory system
    5. Have no circulatory system

**NOTE**: For questions 35 - 38 use information below as reference.

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

Graph 3. pH and Hemoglobin dissociation.

1. A vast majority of Carbon dioxide exist in the blood in the form of
   1. H2CO3
   2. HCO3-
   3. CO3-
   4. CO2
   5. CO
2. When there is high energy demand leading to an elevated heart rate, the hemoglobin of a given patient suffering this condition will
   1. Have allosteric effects due to less breathing cycles.
   2. Experience an increased affinity for CO3-
   3. Experience a reduced affinity for O2
   4. Experience a reduced affinity for CO3-
   5. More than one answer is correct.
3. When there is an in Carbon dioxide concentration in the blood, one would to see expect a in blood pH.
   1. Decrease; decrease
   2. Increase; decrease
   3. Increase; increase
   4. A & C
   5. None of the above
4. Metabolic or respiratory disturbances can cause the pH to shift (acidosis) down or up (alkalosis), giving rise to potentially dangerous ad life threatening conditions. In the case of a patient suffering from Lactic Acidosis syndrome, in response to changing blood pH, respiratory rate may
   1. Rise, in order to decrease the amount of CO2 gas being excreted.
   2. Fall, in order to increase the amount of CO2 gas being excreted
   3. Rise, in order to increase the amount of CO2 gas being excreted
   4. Fall, in order to decrease the amount of CO2 gas being excreted
   5. Rise, in order to maintain the amount of CO2 gas being excreted
5. Panting by an overheated dog is an example of
   1. acclimatization.
   2. torpor.
   3. evaporative cooling.
   4. non-shivering thermogenesis.
   5. shivering thermogenesis.
6. The blood level of which gas is most important in controlling human respiration rate?
   1. nitric acid
   2. nitrogen
   3. oxygen
   4. carbon dioxide
   5. carbon monoxide
7. Toll-like receptors are
   1. pathogen associated molecular patterns found on microbes
   2. pathogen associated molecular patterns found on fruit flys (*Drosophila melanogaster*)
   3. pattern recognition receptors found on mammalian cells
   4. pattern recognition receptors found on microbes
   5. really cool receptors
8. At the venous end of a capillary bed, the osmotic pressure
   1. Is greater than the hydrostatic pressure
   2. Results in a net outflow of fluid
   3. Results in a net re-absorption of fluid into the blood
   4. A & C are correct
   5. None of the above, more information is needed.
9. 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?
   1. Arteries
   2. Veins
   3. Venules
   4. Capillaries
   5. Arterioles
10. These are all part of the innate immune system *except*
    1. B lymphocytes
    2. skin
    3. macrophage
    4. stomach acid
    5. natural killer cells
11. If, during protein starvation, the osmotic pressure on the venous side of capillary beds drops below the hydrostatic pressure, then
    1. hemoglobin will not release oxygen.
    2. fluids will tend to accumulate in tissues.
    3. the pH of the interstitial fluids will increase.
    4. most carbon dioxide will be bound to hemoglobin and carried away from tissues.
    5. plasma proteins will escape through the endothelium of the capillaries.
12. The four characteristics of inflammation are
    1. redness, swelling, numbness, pain
    2. redness, swelling, heat, pain
    3. swelling, cellular activation, fever, jaundice
    4. redness, fever, heat, pain
    5. pain, heat, jaundice, swelling
13. Plasma cells are
    1. effector B-cells which secrete antibodies
    2. memory B-cells
    3. effector T-cells which secrete antibodies
    4. memory T-cells
    5. cells that have never been exposed to pathogen
14. The epithelium type with the shortest diffusion distance is (hint: lungs)
    1. simple squamous epithelium.
    2. simple cuboidal epithelium.
    3. simple columnar epithelium.
    4. pseudostratified ciliated columnar epithelium.
    5. stratified squamous epithelium.
15. Cytotoxic T-cells bind to while Helper T-cells bind to .
    1. CD4 & MHC I; CD8 & MHC II
    2. CD8 & MHC II; CD4 & MHI
    3. MHC II & CD4; MHC II & CD8
    4. MHC I & CD8; MHC II & CD4
    5. Directly to bacteria; directly to viruses
16. Rheumatoid arthritis is
    1. an immunodeficiency disease characterized by antibodies attacking synovial membranes lining the joints
    2. an autoimmune disease characterized by antibodies attacking synovial membranes lining the joints
    3. an autoimmune disease found predominantly in males
    4. an autoimmune disease affecting the myeloid sheaths lining nerve axons
    5. an autoimmune disease causing insulin resistance
17. Which of the following is an example of Immune deficiency conditions?
    1. Lupus
    2. TYPE I diabetes
    3. SCID
    4. MS (multiple sclerosis)
    5. RA (rheumatoid arthritis)
18. Given that carbohydrate digestion begins in the mouth, which of the following aids in the breaking down of cellulose in the mouth after mechanical digestion has begun by mastification?
    1. Mucin
    2. Amylase
    3. Bilirubin
    4. B & C
    5. None of the above
19. The longest section of the alimentary canal is the small intestine, 6m or 18ft long. If there was an intestinal blockage, enteroembolism, shutting entry of food into the small intestine, where would food leaving the stomach accumulate?
    1. At the entry vessels of the ileum
    2. At the exit vessels of the jejunum
    3. At the entry vessels of the duodenum
    4. At the exit vessels of the rectum
    5. None of the above
20. Jaundice also known as hyperbilirubinemia, is a disorder that occurs in several ways in both neonates and adults. Generally in adults, excessive hemolysis can raise the bilirubin levels of blood, or malfunctioning of hepatocytes can prevents bilirubin excretion with bile. Which of the following is an organ that would most likely be associated with Jaundice in an adult female?
    1. Stomach
    2. Gallbladder
    3. Spleen
    4. Bone marrow
    5. Liver

Thank you for coming,

SI Website: <http://www.elielarrey.com/biology-1442.html>

SI FORUM: Check OUT FORUM from SI website, feel free to contact me or POST questions for your peers.

Yours,

El.