Physiology Lecture Quiz, Summer

Lab Day: _______________ Name:________________

Quiz consists of 47 questions (4 pages)

1. List the 6 elements (by symbol) that make up 99% of your body weight
   C    H    O    N    Ca    P

2. The smallest living units in the body are:________________

3. Name the 11 systems of the body and circle the one that is not essential to life.
   Integumentary  Skeletal  Muscular  Nervous  Endocrine  Cardiovascular
   Lymphatic  Respiratory  Digestive  Urinary  Reproductive

4. __Lymphatic________ Name the body system the functions to return “leaked” fluids back to
   the blood stream and contains such organs as the thymus and spleen.

5. __Pathophysiology_______ Name the division of physiology that studies the effects of diseases
   on organ or system functions.

6. __Urinary__________ Name the specific body system that functions in the removal of
   nitrogenous wastes and maintains body fluid volume, pH, and electrolyte levels.

7. __Endocrine__________ Name the body system that contains the pancreas, pituitary and
   adrenal glands.

8. __Homeostasis________ The term used to describe the tendency of the body’s systems to
   maintain a relatively constant or stable internal environment.

9. __Electroencephalography (EEG)___ Name the procedure/test that records the electrical activity
   in the brain through the use of electrodes on the surface of the scalp.

10. __Percussion__________ Give the term that describes a tapping of the fingers or hand to
    obtain information about the densities of underlying tissues.

11. __Laparoscopy________ Name the specific type of endoscopy used to visualize the surface of
    abdominopelvic organs such as the liver, gallbladder, and uterus.

12. __Cystoscopy__________ Name the specific type of endoscopy used to visualize the inside of
    the urinary bladder.

13. __Thyroid Gland________ Name the specific organ that is studied by administration of a
    radioactive iodine uptake test (RAI).

14. __Computerized Tomography (CT) Scan___ Name of the medical imaging procedure that uses
    X-ray beams that arc at multiple angles around the body, producing a cross-sectional picture
    and can be used to produce 3D images?

15. __Ascites______________ Name the condition that is characterized by distention of the
    peritoneal cavity due to accumulation of several liters of serous fluid.

16. Name the two subdivisions of the dorsal cavity:
    __Cranial Cavity_________ _______ Vertebral Canal or Cavity_______

17. When the initial stimulus produces a response that suppresses or reverses the original
    stimulus and corrects the situation, the mechanism is called:
    A. Negative feedback     B. Positive feedback C. Autoregulation     D. Extrinsic regulation

18. Describe the three main components of a feedback system.
   1. **Receptor (Sensor):** Sensor that monitors and detects changes (stimulus) in a
      condition (variable)
      • Sends that information to a control center via a nerve impulse or chemical signal.
   2. **Control center:** Structure such as the brain, that receives and processes the
      information supplied by the receptor.
      • Sets the range of values at which the condition should be maintained and
        determines an appropriate response
   3. **Effector:** Cell or organ that receives output from the control center and produces a
      response that changes the condition by either depressing (negative feedback) or
      enhancing (positive feedback) the stimulus.
19. Blood Pressure drops when a person goes from a lying to standing position. In order to correct the decreased drop in blood pressure the body uses mechanisms to increase blood pressure. Do these mechanisms use a positive or negative feedback processes? Describe how the body responds to correct this situation.

When you stand up, gravity causes blood to settle in the lower part of your body. Blood pressure receptors known as **baroreceptors (sensors)** detect the change in blood pressure. **Baroreceptors** are specialized sensory neurons in the walls of the **aortic arch** and the **carotid sinuses** that measure the degree of stretch in the vessel wall. Information is sent from the **baroreceptors** to the **medulla oblongata** via sensory nerves. The **Medulla oblongata (control center)** analyzes the change in blood pressure and sends a nerve impulse to the heart and blood vessels (mainly arterioles), both of which are effectors, to correct the decrease in blood pressure.

- Heart rate and amount of blood pumped are increased causing an increase in blood pressure
- Vasoconstriction of arterioles increases blood pressure.

Thus if BP is too high or too low, a reflex change in cardiac output is initiated in order to correct it. **This is a negative feedback process**

20. List and describe the six levels of structural organization. **Description can be found in the notes**

21. Label the body

1. Cranial cavity
2. Spinal cavity
3. Mediastinum
4. Pleural cavity
5. Pericardial cavity
6. Diaphragm
7. Abdominal cavity
8. Pelvic cavity
9. Abdominopelvic cavity
10. Ventral cavity
Match the word root, prefix, or suffix with the correct term

<table>
<thead>
<tr>
<th>Term</th>
<th>Terms</th>
</tr>
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<tbody>
<tr>
<td>22. oligo-</td>
<td>few, little, deficient</td>
</tr>
<tr>
<td>23. -oma</td>
<td>tumor</td>
</tr>
<tr>
<td>24. nephro-</td>
<td>kidney</td>
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<tr>
<td>25. acou-</td>
<td>hearing</td>
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<tr>
<td>26. -algia</td>
<td>painful condition</td>
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<tr>
<td>27. baro-</td>
<td>weight, pressure</td>
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<tr>
<td>28. brady-</td>
<td>slow</td>
</tr>
<tr>
<td>29. cysti-, cysto-</td>
<td>sac, bladder</td>
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<tr>
<td>30. hepato-</td>
<td>liver</td>
</tr>
<tr>
<td>31. iso-</td>
<td>equal, same</td>
</tr>
<tr>
<td>32. -penia</td>
<td>deficiency</td>
</tr>
<tr>
<td>33. -poiesis</td>
<td>make, formation of</td>
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<tr>
<td>34. retro-</td>
<td>backward, behind</td>
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<tr>
<td>35. thrombo-</td>
<td>blood clot</td>
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<tr>
<td>36. viscer-</td>
<td>internal organ</td>
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</table>
37. Explain regulatory processes involved in the formation/dissipation of a fever that is caused by certain types of infections. How do antipyretics such as aspirin work?

The hypothalamus regulates body temperature. Normal body temperature is at 98.6 °F (37 °C). A fever is an elevation of core temperature caused by a resetting of the hypothalamic thermostat. Common causes of fever are viral or bacterial infections and bacterial toxins.

- **Steps involved with fever formation caused by bacterial infection.**
  1. When macrophages and other phagocytes ingest certain bacteria, they are stimulated to secrete a pyrogen, a fever-producing substance. One pyrogen is interleukin -1 (IL-1).
  2. IL-1 circulates to the hypothalamus and induces neurons to secrete prostaglandins that function to reset the hypothalamic thermostat at a higher temperature, let's say the hypothalamus thermostat is reset at 103 F (39 C).
    - Prostaglandins are local chemical mediators which in this case, act directly on the hypothalamus.
  3. Temperature regulating reflex mechanisms then act to bring the core body temperature up to this new setting. The heat-promoting mechanisms (vasoconstriction, increased metabolism, shivering) are operating at full force. Thus, even though core temperature is climbing higher than normal – say, 101 F (38 C) – the skin remains cold due to vasoconstriction of blood vessels, and shivering occurs. This condition, called a chill, is a definite sign that core temperature is rising. After several hours, core temperature reaches the new setting of the thermostat, and the chills disappear. But now the body will continue to regulate temperature at 103 F (39 C).
4. **When the pyrogens disappear**, the thermostat is reset at normal, 98.6 F (37 C). Because core temperature is high in the beginning, the heat-losing mechanisms (vasodilation and sweating) go into operation to decrease core temperature. The skin becomes warm, and the person begins to sweat. This phase of the fever indicates the core temperature is falling – commonly referred to as “the fever has broke”.

- **Antipyretics and Fever Reduction**
  - **Antipyretics** such as aspirin are agents that relieve or reduce fever by inhibiting synthesis of certain prostaglandins within the hypothalamus and thus inhibit the effects of pyrogens to reset the hypothalamic thermostat.
  - Aspirin does not lower the temperature in a person without a fever because in the absence of endogenous pyrogens, prostaglandins that work in resetting the hypothalamus are not produced in the hypothalamus in appreciable quantities.

38. Sarah wants to know the effect of different levels of nitrogen fertilizers on the growth of plants. She believes that plants can grow best in high nitrogen fertilizer. She buys 4 ferns of the same species, which are all approximately the same age and height. She places one in soil without nitrogen, one in low nitrogen soil, one in medium nitrogen soil, and one in high nitrogen soil. All of the ferns are planted and given 20 mL of water once a day for 2 weeks. After the two weeks, Sarah observes the plants and makes measurements. **Hypothesis**: If plants are grown in high nitrogen soil, then they will grow taller.

- **Independent Variable**: level of nitrogen in soil
- **Dependent Variable**: height of plant
- **Control Group**: plant in soil without nitrogen;
- **Experimental Group**: plants in nitrogen soil

39. Place these terms in the typical sequence in which they appear in the process of scientific inquiry: collect and analyze data, theory, model, question, hypothesis, experiment, observation, replication,

**Possible terms to use for the following questions:**

- **Blind**  
- **Double-blind**  
- **Crossover**  
- **Retrospective**  
- **Placebo**  
- **Nocebo**

- **Independent variable**
- **Dependent variable**

40. A study in which a participant acts as an experimental subject in part of the experiment and a control in another part of the experiment is called a _**Crossover**_ study.

41. A drug or treatment that is expected to have no pharmacological effect called a _**Placebo**_.

42. Term of an educated (logical) guess as to how that event happens: _**hypothesis**_.

43. If a scientific model is supported or verified repeatedly by multiple investigators, it may become a _**Theory**_.

44. It is the phenomenon whereby a patient who has been informed of the side effects of a drug he is taking is more likely to experience some of the side effects than an otherwise similar patient receiving the same drug who has not been so informed. This is known as the _**Nocebo**_ effect.

45. The _**independent variable**_ is the variable that is controlled by the experimenter, it is the variable that is altered or removed.

46. _**Double-blind**_ study is when a third party, not involved in the experiment, is the only one who knows which group is receiving the experimental treatment and which group is receiving the control treatment.

47. _**Double-blind crossover**_ study is when the control group is the first half of the experiment becomes the experimental group in the second half, and vice versa, but no one involved (except the third party) knows who is taking the active treatment.