HOWARD UNIVERSITY
COLLEGE of ARTS and SCEINCES
COMPREHENSIVE SCIENCES

LIFE SCIENCES – UNIT III: STRUCTURE AND PHYSIOLOGY

1. Define Anatomy, Morphology, Physiology.

2. List the physical/chemical levels of organization of life in descending order.

3. Define quark.

4. (a) Define atom. (b) List the sub-atomic particles. (c) Sketch the hydrogen (H^+)atom and correctly label the components. (d) Cite how atomic weight and atomic numbers are determined.

5. Define element. List the bioelements.

6. Cite a difference between the following types of chemical bonds:
   a. ionic b. covalent c. hydrogen
   Which type of chemical bond is found in the organic molecules of living matter?

7. Cite one distinctive difference between organic and inorganic substances.

8. List four inorganic substances that are essential for living matter. Cite brief function for each.

9. Cite four monomer/unit organic molecules and the macromolecule they comprise.

Monomer/Unit	Macromolecule

10. Cite one function for each of the following macromolecules-proteins, carbohydrates, lipids, nucleic acids.

11. Indicate the organic or inorganic molecules of living matter that the following reagents/tests are used to detect:

    a. Benedict's solution _____

    b. Lugol's solution (IKI) _____

    c. Biuret solution _____

    d. pH strip paper/pH meter_____

    e. Sudan black _____

12. A student was given a sample of unknown matter. The sample formed a black residue upon burning. Further tests on the sample showed negative results for the Biuret, Sudan black and Lugol's test solutions. The pH of the sample was 9. The sample showed a positive test result with Benedict's solution.

    The sample was _____ with a preponderance of_____ions.

13. Cite a function for the following cell organelles:

Organelle	**Functiion**
cell wall	
cell membrane	
centrioles	
cytoplasm	
golgi body	
nucleus	
mitochondrion(a)	
ribosomes	
valcuole	
chloroplast	

14. Cite an organelle that is exclusively found in animal cells.

15. Define cell. Cite two characteristics of cells.

16. What two macromolecules comprise membraneous structures in cells.

17. What is significant about the He La cell line? How long have these cells been cultured in scientific laboratories?

18. List:

    a. two different types of plant cells
    b. two different types of animal cells
    c. three morphologies of bacterial cells
    d. a protozoan single celled organism that has cilia

19. (a) Define tissue
    (b) List three types of animal tissues and cite a function for each
    (c) List three types of plant tissues and give a function for each

20. How many ORGAN SYSTEMS are exhibited by:

    (a) advanced plants—name the systems
    (b) advanced animals—name the systems and give a function for each system

21. (a) List the plant ORGANS.
    (b) Cite a function for each organ.

22. (a) Cite a function for each of the following animal ORGANS.

    skin
    bone
    small intestine
    ovary(ies)
    testis(es)
    pancreas
    liver
    lung

23. (a) List two types of plant roots.
    (b) List one type of plant root modification.

24. (a) List one type of plant leaf venation pattern.
    (b) List two types of leaf modifications.

25. (a) List the function of the plant stem.

(b) List two types of stem modifications.

26. (a) What is a rhizome?
(b) List two types of a plant strobilus.

27. Identify each of the following as a LEAF, STEM or ROOT:

(a) blossom
(b) potato tuber
(c) come
(d) white "fleshy" part of onion that is edible
(e) "fleshy" part of celery that is edible

28. List two EXTERNAL organs viewed in the laboratory frog and place them into the correct organ system.

29. List two INTERNAL organs viewed in the laboratory frog and place them into the correct organ system.

30. List a scientist that worked on the following:

a. cell

b. atom

c. developed first microscope

d. detected mitochondria