1)**What is meant by Systems Biology? What are some of the problems you think this new discipline can solve that traditional genetics or genomic studies can't?**

Systems biology is the computational and mathematical modeling of complex biological systems. It is the field of biology that focuses on complex interactions within biological systems by using a holistic approach to biological research.

Analysis of the interactome, or how cell components interact with their neighbours (it is not static) can be answered by this field which is not possible by traditional genetics.

This field is comfortable working with data from all the other fields of biology, chemistry and information technology, which is not possible for traditional genetics.

For genome analysis, it is less time consuming and easy to work with. But this is not the case for traditional genetics.

2) **Which of the following is the most complex level of hierarchical abstraction currently recognized by Synthetic Biology Open Language (SBOL)?**

a. DNA b. Part c. Device d. System e. Organism

The following is the most complex level of hierarchical abstraction currently recognized by Synthetic Biology Open Language (SBOL):

A) DNA

3) **The Special Senses**

1. List the classes of sensory modalities and the types of senses in each class. a. Describe the different types of sensory receptors. Outline the events in detail of a sensory receptor responding to a stimulus.

1) Sight: Sight (ophthalmoception) is the ability of the eyes to focus and detect images of visible light on photoreceptors in the retina.

Biological species concept defines that a species is a group of actually or potentially interbreeding individuals, which are reproductively isolated from other such groups.

5) **Mechanical propterties of biological tissues.**

Load is the general term for application of a force to a body (or moments applied to a biological tissue.

Force is a Push or a Pull that can produce, stop, or modify a movment.

Moment is caused by the force acting at a distance from the center of rotation.

Tissues will often deform with loading.

Body structure is rigid and does not deform (As for example bones).

Stress is the internal resistive force per unit area in a structure due to the application of an external force. The equation of stress can be explained by the F/A, where F= external force, A= Surface area.

Deformation can be explained by the change in original dimensions of a structure due to external F.

Strain can be explained by the the ratio of the change in length to the original length of structure under stress. Strain equation (normal/axial), E= (L2-Lo)/Lo Lo= original length. Strains are two types shear and normal.

A elastic region shows the linear relationship between load and deformation, no permanent deformation occurs, loaded tissue recovers all energy used to deform it. Theoretically each tissue has a constant representing its elasticity.

Tissue density curve explains that higher tissue density has greater toughness, stiffness, and ultimate strength; Stiffness= slope of elastic region, toughness = area under curve, ultimate strength= peak of curve max.