KENYA METHODIST UNIVERSITY
End of Trimester 1 Examination, April 2008

Faculty : Science & Social Studies
Department : Computer and Information Science
Course Code : BIOL 101
Course Title : Introduction to Biology
Time : 2 Hours

Instructions: This Paper Contains Sections A and B. All are compulsory

SECTION A

1. Match each of the cell components in column A with the function in Column B.

Mitochondria	Manufacture of lipids
Golgi Body	Synthesis of proteins
Smooth endoplasmic reticulum	Manufacture of food
Ribosomes	Formation of ATP
Chloroplast	Formation of secretory granules
Cell membrane	Digestion of unwanted material
Lysosome	Regulation of movement in and out of the cells
Nucleus	Control activities of the cell
	(8 Marks)

(b) Arrange the following from the smallest to the larges:

Tissue, cell, organism, organelle, organ (1 Mark)

2. Define the following terms;

(i) Diffusion (1 Mark)
(ii) Osmosis (1 Mark)
(iii) Active transport (1 Mark)
(iv) Phagocytosis (1 Mark)

(b) The following information refers to a feeding relationship in a fresh water lake;

1) Small crustaceans, tadpoles and insect larvae feed on water plants.
2) Water beetles feed on insect larvae, tadpoles and small crustaceans.
3) Roach feeds on small crustaceans and insect larvae.
4) Frogs feed on insect larvae and small crustaceans.
5) Perch feeds on roach, water beetles and frogs.
6) Pike feeds on roach, perch and frogs.

(i) Draw a food web for the ecosystem . (3 Marks)

(ii) Name all the organisms that occupy the second trophic level. (1½ Marks)

(iii) Name and organism that occupies two trophic levels and name the levels.
(1½ Marks)

(iv) Write down two food chains from the web with four consumers including the roach.
(2 Marks)

3. (i) Describe the scientific method. (4 Marks)

(ii) The scientific name for rat tiger is *Panthera tigris*.

a) What taxonomic level does Panthera represent? (½ Mark)
b) What taxonomic level doe tigris represent? (½ Mark)
c) Name the lowest taxonomic group. (½ Mark)
d) What are the unique features of this group. (2 Marks)
e) Distinguish artificial and natural classification. (2½ Marks)

4. a) Make a table listing any five air pollutants and their sources (2½ Marks)
b) Define soil erosion. (1 Mark)
c) Name 4 methods of controlling soil erosion. (2 Marks)
d) How are tapeworms adapted to their parasitic way of life? (2 Marks)

5. a) Name the pigment contained in cells that transport oxygen. (½ Mark)
b) Name the blood vessel that transports blood away from the heart (½ Mark)
c) Name the circulatory system found in insects. (½ Mark)
d) The vascular bundles consists of …… and …… (1 Mark)

6. The letter A and a represent the dominant and recessive genes for a particular trait.
(a) Write down the genotypes of the following;

(i) homozygous dominant
(ii) homozygous recessive
(iii) heterozygote
(iv) gametes produced by the heterozygote
(2 Marks)

(b) Define;

(i) gene
(ii) allele
(iii) genotype
(iv) phenotype
(2 Marks)

(c) What is speciation (1 Mark)

(d) Many animals have organs that appear to have little or no function and are usually smaller than their fully functional equivalents in related species.

(i) What is the scientific name of such organs. (1 Mark)
(ii) Give 4 examples of such organs in man. (2 Marks)

(e) (i) The wings of a bird and those of an insect are superficially similar but their internal structure is completely different. Name the type of evolution that has led to similarity in the two wings. (1 Mark)

(ii) Give one other example of this type of evolution. (1 Mark)

SECTION B

1. Discuss the SIX evidences that support the theory of evolution of organism. (10 Marks)

2. Discuss conservation of natural resources. (10 Marks)