

## FIRST TERM E-LEARNING NOTE

**SUBJECT: BIOLOGY**

**CLASS: SS 3**

### SCHEME OF WORK

#### WEEK TOPIC

1. Regulation of internal environment, structures and function of the kidney, diseases, effects and remedy.
2. Liver: – Structure, functions and diseases, Skin: – Structure, functions, diseases and care.
3. Hormones: - Location, secretion, function, effects of over-secretion and under-secretion.
4. Nervous co-ordination: - CNS component, structure and functions of the brain and spinal cord
5. The peripheral nervous system and the neurone.
6. Reflex and voluntary actions, conditional reflex.
7. Sensory organs: - Skin as a sense organ, organ of sight (The eye).
8. Organ of hearing, smell and taste.
9. Development of new organisms (Courtship behavior in animals, Stages in development of toad, insects)
10. Development of new organisms (Seeds, fruits in plants, Germination of seeds)

#### REFERENCES

- College Biology by Idodo Umeh
- Modern Biology for Senior Secondary Schools by S.T. Ramlingam
- Essential Biology by M.C Michael
- New Biology by H. Stone and Cozen
- SSCE, past questions and answers
- UME and CAMBRIDGE past questions and answers
- Biology practical text

#### WEEK ONE

#### REGULATION OF INTERNAL ENVIRONMENT

##### CONTENT

- Homeostasis, mechanism and structures of homeostasis
- Structures of the Kidney
- Functions of the Kidney
- Kidney diseases, effects and remedy

##### HOMEOSTASIS

Homeostasis is the process by which a fairly constant internal environment is maintained in an organism. The internal environment of an organism is made up of the body fluid such as blood, lymph and tissue fluid. For efficient functions of body cells and healthy growth, a living organism must be able to adjust to any change in the physical and chemical conditions of its body fluids. These conditions include temperature, PH, osmotic pressure, concentrations of dissolved substances and mineral ions.

##### MECHANISM OF HOMEOSTASIS

Homeostatic processes are control mechanisms which are used to detect and adjust to changes in the internal environment of the organism. These mechanisms usually include:

- a. Sensory detectors which recognize a change in a given condition and stimulate the relevant body parts.
- b. Effectors organs or glands which react and restore the normal state.

##### STRUCTURES FOR HOMEOSTASIS

Osmoregulation (homeostasis) in unicellular organism is ensured by the use of contractile vacuole. The main organs involved in homeostasis in multicellular organisms include; kidney, liver, skin,

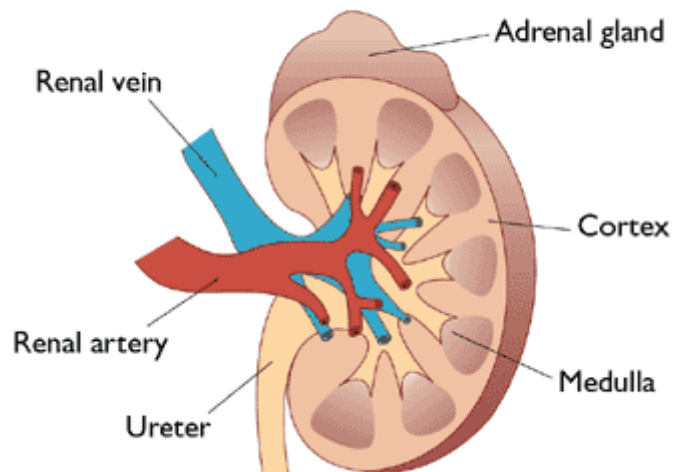
ductless glands (hormones) and the brain which has the overall control of the homeostatic process in the body.

#### EVALUATION

1. What is homeostasis? List four factors of homeostasis.
2. List four structures of homeostasis in multicellular animals

#### STRUCTURE OF THE KIDNEY

Diagram of Kidney



The mammalian kidney is a bean-shaped, reddish brown organ located in the posterior end of the abdomen. The right kidney is slightly lower in the body than the left. Cutting a kidney longitudinally, two distinct regions are observed; an **outer cortex** and an **inner medulla**. Several narrow tubules called urinary tubules (nephrons) pass through the two regions stated above. The tubules open at the tips of triangular – shaped masses of tissues called pyramids. The pyramids open into a funnel-shaped cavity called the **pelvis**. The kidney has many tiny capillaries which are branches of the renal artery and the renal vein. The pelvis continues as ureter, a long narrow tube connecting the kidney to the urinary bladder.

#### FUNCTIONS OF THE KIDNEY

The kidney serves as the chief osmoregulator and excretory organ in the body of mammals, performing the following functions:

- a. It removes toxic wastes and harmful substances.
- b. It produces heat during cold.
- c. It excretes nitrogenous wastes like urea.
- d. It regulates water level in the body
- e. It assists to regulate pH of the body.
- f. It maintains salt or ion-balance in the body.

The first three are excretory functions while the last three are osmoregulatory functions of kidney

#### KIDNEY AS AN OSMOREGULATOR

Kidney is an osmoregulator by maintaining the water, salt and pH balance of the blood and this occurs in...