**Disease :-** Is an abnormal condition of a living thing.

**pathology**:- is that branch of biology that involves the study of living things in their abnormal forms and conditions is the development and the structural and functional changes produces by them.

**Etiology:-**Refer to the cause of disease and contributing factors. (Ecological, Immunological, Physiological)

**Pathogenesis :-** Refer to the mechanism of development of disease and it is the ability to cause disease by ability to initiation of the infection process and the mechanism that lead to the development of signs and symptoms of disease.

**Lesion:-**The characteristic change in an organism produced by disease is a tissue cellular or molecular alternation that develops as a result of disease- producing .

**Atrophy :-** is shrinkage of cell by loss of cell substrate or decrease in the size of organ due to decrease in the size of cell .

**Hypertrophy:-**An increase in size of the cell lead to increase in size of organ new cell are not formed there is enlargement of cell. **Ex:** muscles of body builders.

**Hyperplasia:-**An increase in number of cell in an organ or

tissue due to mitotic activity that lead to increase in size or volume. **Ex:** breast during pregnancy (physiological) and lactation thyroid hyperplasia (pathological)

**Necrosis:-** It is the cell or tissue death in the living body & resulting from the temporary or permanent loss of the blood supply to the tissue.

**Apoptosis** :- is a part of programmed cell death.

**Repair:-**Is the process by which the tissue returns to normal or approximately normal state. Cells that have been destroyed are either replaced by healthy cells of the same type growing in from adjacent living.

tissue (Regeneration) or by the replacement of dead cells by fibrous tissue and new blood vessels that also come from uninjured neighboring tissues (granulation tissue or scar tissue). Is one of the end stage of inflame.

**Melanoma:-** which is caused by too much exposure to ultraviolet light from the sun, is thought to be caused in part by uncontrolled inflammation of the skin.

**Medical laboratory:-** A medical laboratory is a laboratory where tests are done on clinical specimens in order to get information about the health of a patient as pertaining to the diagnosis, treatment, and prevention of disease.

**Departments of Medical laboratory**

Laboratory medicine is generally divided into two sections, each of which being subdivided into multiple units.

**These two sections are:**

**A-Anatomic pathology:** units included here are histopathology, cytopathology, and electron microscopy.

**B-Clinical pathology, which includes:**

1. Clinical Microbiology: This encompasses five different sciences (units).

These include bacteriology, virology, parasitology, immunology, and mycology.

2. Clinical Chemistry: Units under this busy section include instrumental analysis of blood components, enzymology, toxicology and endocrinology.

3. Hematology: This section consists of automated and manual analysis of blood cells. It includes two subunits, which are coagulation and blood bank.

4. Genetics is also studied along with a subspecialty known as cytogenetics.

5. Reproductive biology: Semen analysis, Sperm bank and assisted reproductive technology.

**1. Microbiology** receives almost any clinical specimen, including swabs, feces, urine, blood, sputum, cerebrospinal fluid, as well as possible infected tissue. The work here is mainly concerned with cultures, to look for suspected

pathogens which, if found.

biochemical tests. Also, sensitivity testing is carried out to determine whether the pathogen is sensitive or resistant to a suggested medicine. Results are reported with the identified organism(s) and the type and amount of drug(s) that should be prescribed for the patient.

**2. Parasitology** is a microbiology unit that investigates parasites. The most frequently encountered specimen here is faeces. However, blood, urine,
sputum, and other samples may also contain parasites.

**3. Virology** is concerned with identification of viruses in specimens such as blood, urine, and cerebrospinal fluid.

**4. Hematology** works with whole blood to do full blood counts, and blood films as well as many other specialised tests.

**5. Coagulation** requires blood samples to analyze blood clotting times and coagulation factors.

**6. Clinical Biochemistry** usually receives serum or plasma. They test the serum for chemicals present in blood. These include a wide array of substances, such as lipids, blood sugar, enzymes, and hormones.

**7. Toxicology** mainly tests for pharmaceutical and recreational drugs. Urine and blood samples are submitted to this lab.

**8. Immunology/Serology** uses the concept of antigen-antibody interaction as a diagnostic tool. Compatibility of transplanted organs is also determined.

**9. Immunohaematology, or Blood bank** determines blood groups, and performs compatibility testing on donor blood and recipients. It also prepares blood components, derivatives, and products for transfusion. Regulated by the FDA since giving blood is considered a drug, this unit determines a patient's blood type and Rh status, checks for antibodies to common antigens found on red blood cells, and cross matches units that are negative for the antigen.

**10. Urinalysis tests** urine for many analytes. Some health care providers have a urinalysis laboratory, while others don't. Instead, each component of the urinalysis is performed at the corresponding unit. If measuring urine chemicals is required, the specimen is processed in the clinical biochemistry lab, but if cell studies are indicated, the specimen should be submitted to the cytopathology lab, and so on.

**11. Histopathology processes** solid tissue removed from the body (biopsies) for evaluation at the microscopic level.

**12. Cytopathology** examines smears of cells from all over the body (such as from the cervix) for evidence of inflammation, cancer, and other conditions.

**13. Electron microscopy** prepares specimens and takes micrographs of very fine details.

**14. Genetics** mainly performs DNA analysis.

**15. Cytogenetics** involves using blood and other cells to get a karyotype. This can be helpful in prenatal diagnosis (e.g. Down's syndrome) as well as in cancer (some cancers have abnormal chromosomes).

**16. Surgical pathology** examines organs, limbs, tumors, fetuses, and other tissues biopsied in surgery such as breast mastectomy's.