**IQRA NATIONAL UNIVERSITY**

**DEPARTMENT ALLIED HEALTH SCIENCE**

**DPT 4th SEMESTER FALL 2020**

**TIME 48 HOURS**

**COURSE PATHOLOGY**

**MID TERM**

**MARKS 30**

 **INSTRUCTOR DR imran sir**

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**QUESTION NO ONE.WHAT IS CANCER .HOW IS CANCER DIAGNOSIS? WHAT IS THE ROLE OF GENETICS IN CANCER? ALSO EXPLAIN TNM DIAGNOSTIC TEST FOR CANCER.**

**Answer.what is cancer.**cancer is a group of disease characteristics by uncontrolled growth and spread of abnormal cellif the spread is not controlled it can result in death.

**DIAGNOSIS OF CANCER.**

**.** There are several methods of diagnosis cancer with advantage in technology that understands cancer batter .

. There are rises of numbers of diagnostic tools that can helps detect cancer.

. Diagnosis is usually made by pathologist and oncopathologist .

. Some type of cancer . Particularly lymph nodes. Can be hard to classify even for an expert . Most cancer need a second opinion regarding diagnosis before beings sure of diagnosis or stages and type.

**Role of genetics in cancer:**

Gene:

Gene is a unit of DNA that encoded a particular protein or RNA molecule or unit of heredity

Mutation(permanent changes in the base sequence of DNA) alters the gene and

**Four target gene for genetic damage**:

**1 PROTOONCOGENES.** Normally promoted normal cell growth .mutation convert them oncogenes .

**2 TUMOR SUPRESSOR GENES .** Normally restrian cell growth loss of function result in unregulated growth.

**3 mutator or DNA REPIAR GENE.** When faulty results in accumulated rate of mutations.

**4 Gene regulating apoptosis**:

Apoptosis is a pathway of program cell death.

When the cell is so much damaged that its DNA can’t be repaired so there will be a risk of mutation of DNA. Which can result in cancer,so the cell is killed with apoptosis by gene regulating apoptosis

**TNM diagnostic test for cancer:**

TNM is used for staging cancer.

T: stands for tumor,that how far the tumor has grown locally.

N: stands for nodes,that if the cancer has spread to the local lymph nodes.

M: stands for metastasis,if the cancer has spread in the other parts of the body.

**QUESTION NO TWO .: Write down any viral or bacterial disease in detail**

**AIDS** .. it is a disease in which there is serve loss of body cellular immunity gradually lower in the resistance to infection.

**SIGNS symptoms**

Major.

1 weight loss 10 %body weight.

2 chronic diarrhea >1 month duration .

3 prolonged fever >1 months.

Minor .

Recurrent oral – pharyngeal candidiasis

Persistent generalised lymphadenopathy

Persistent cough- 1 month

Recurrent herpes zoster .

**Causes..**

Aids caused by HIV .

Hiv Is a virus that gradually attacks immune system .as HIV progressively damaged theses cell the body becomes more vulnerable to infection which it will have difficulty in fighting of . It is the point of very advanced HIV infection that a person is said to have aids . If left untreated.it can take around ten year before HIV has damaged the immune systems enough for aids to develop.

**Diagnosis**

. The diagnosis of hiv infection requires identification of antibodies to HIV and decreased CD 4 counts .

. Elisa test( enzymes linked immuno sorbent Assay). Detected antibodies are detected after 4 .12 weak after infection (window period) it is easy cheap and less time consuming.

.western blot test .highly specific but time consuming.expensive and complicated.

**AIDS**

**T**reatments

At this time, there is no cure for AIDS, but medications are effective in fighting HIV and its complications. Treatments are designed to reduce HIV in your body, keep your immune system as healthy as possible and decrease the complications you may develop.

You and your doctor will work together to develop a treatment plan that best meets your needs. Three main factors will be considered when designing your treatment plan:

**Q3: Explain structure of bacterial cell. How antibiotics kill bacteria? What is the mode of action of antibiotics**?

A3: Bacteria:

Bacteria are prokaryotes that lack well defined nuclei and membrane bound organelles and with chromosome composed of a single closed DNA circle.

**Structure**

Bacteria (singular: bacterium) are classified as prokaryotes, which are single-celled organisms with a simple internal structure that lacks a nucleus, and contains DNA that either floats freely in a twisted, thread-like mass called the nucleoid, or in separate, circular pieces called plasmids. Ribosomes are the spherical units in the bacterial cell where proteins are assembled from individual amino acids using the information encoded in ribosomal RNA.

Bacterial cells are generally surrounded by two protective coverings: an outer cell wall and an inner cell membrane. Certain bacteria, like the mycoplasmas, do not have a cell wall at all. Some bacteria may even have a third, outermost protective layer called the capsule. Whip-like extensions often cover the surfaces of bacteria — long ones called flagella or short ones called pili — that help bacteria to move around and attach to a host.

**Different types of antibiotics work in one of the two ways:**

1. Bactericidal antibiotics:

That kill the bacteria by interfering with either the formation of the bacterial call or its cell contents.

2. Bacteriostatic antibiotics:

That inhibits the multiplication of bacteria

**Mode of action of action of antibiotic**

Different antibiotics have different modes of action, owing to the nature of their structure and degree of affinity to certain target sites within bacterial cells.

**1 Inhibitors of cell wall synthesis.** While the cells of humans and animals do not have cell walls, this structure is critical for the life and survival of bacterial species. A drug that targets cell walls can therefore selectively kill or inhibit bacterial organisms. **Examples: penicllins, cephalosporins, bacitracin and vancomycin**.

**2 Inhibitors of cell membrane function**. Cell membranes are important barriers that segregate and regulate the intra- and extracellular flow of substances. A disruption or damage to this structure could result in leakage of important solutes essential for the cell’s survival. Because this structure is found in both eukaryotic and prokaryotic cells, the action of this class of antibiotic are often poorly selective and can often be toxic for systemic use in the mammalian host. Most clinical usage is therefore limited to topical applications. Examples: **polymixin B and colistin**.

**3 Inhibitors of protein synthesis**. Enzymes and cellular structures are primarily made of proteins. Protein synthesis is an essential process necessary for the multiplication and survival of all bacterial cells. Several types of antibacterial agents target bacterial protein synthesis by binding to either the 30S or 50S subunits of the intracellular ribosomes. This activity then results in the disruption of the normal cellular metabolism of the bacteria, and consequently leads to the death of the organism or the inhibition of its growth and multiplication.  **Examples: Aminoglycosides, macrolides, lincosamides, streptogramins, chloramphenicol,** **tetracyclines**.

**4 Inhibitors of nucleic acid synthesis**. DNA and RNA are keys to the replication of all living forms, including bacteria. Some antibiotics work by binding to components involved in the process of DNA or RNA synthesis, which causes interference of the normal cellular processes which will ultimately compromise bacterial multiplication and survival. **Examples: quinolones, metronidazole, and rifampin**.

**5 Inhibitors of other metabolic processes**. Other antibiotics act on selected cellular processes essential for the survival of the bacterial pathogens. **For example, both sulfonamides and trimethoprim disrupt the folic acid** pathway, which is a necessary step for bacteria to produce precursors important for DNA synthesis. Sulfonamides target and bind to dihydropteroate synthase, trimethophrim inhibit dihydrofolate reductase; both of these enzymes are essential for the production of folic acid, a vitamin synthesized by bacteria, but not humans.