**Final-Term Assignment**

**Course Title: Human Physiology II**

**Rad 2nd semester section A**

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**Section = Radiology (A)**

**Marks: 50**

**Note:**

* **Attempt all questions, all questions carry equal marks.**
* **Answer Briefly and to the point, avoid un-necessary details**

**Q1:** (A) How stimulus of smell moves from nostril to brain? Make a Diagram as well

Ans 1) ANSWER:

The brain receives information about odors from olfactory receptors, which are embedded in the membrane of sensory neurons in the nasal cavity. Any time an odor molecule interacts with a receptor, an electrical signal travels to so-called glomeruli in the olfactory bulb.

**Q 2:** (A) What is difference between Haemostasis, Haematopoiesis and Homeostasis?

Ans 2 A) Haemostasis:

IS Of aound healing and involves blood clotting

\* Steps of Haempstasis:

It have three major steps.

1) Vasoconstriction.

2) Temporary blockage of break by a platelet plug.

3) Blood Coagulation.

\* Haematopoiesis:

It is a process of forming blood cells which occurs during embryogenesis and throughout life.

\* Homoestasis:

It is a process by which variables are regulated so that internal conditions remains stable and relatively constant.

\* For Example:

\* It includes the regulation of temperature and the balance between acidity and alkalinity.

\* It is process that maintains the stability of the human body, s enviroment to change it external condition.

(B) What is Erythroblastosis fetalis?

Ans 2)B: Erythroblastosis fetalis:

The adult human body is home to trillions of red blood cells, also known as RBCs or erythrocytes. These blood cells carry oxygen, iron, and many other nutrients to the appropriate places in the body. When a woman is pregnant, it’s possible that her baby’s blood type will be incompatible with her own. This can cause a condition known as erythroblastosis fetalis, where the mother’s white blood cells (WBCs) attack the baby’s RBCs as they would any foreign invaders. This condition is highly preventable and the typical, severe form is now very rare in developed countries. Catching it early can ensure a successful pregnancy for mother and child. If left untreated, however, it can be life-threatening for the baby. Erythroblastosis fetalis is now known as hemolytic disease of the newborn.

\* symptoms of erythroblastosis fetalis:

Babies who experience erythroblastosis fetalis symptoms may appear swollen, pale, or jaundiced after birth. A doctor may find that the baby has a larger-than-normal liver or spleen. Blood tests can also reveal that the baby has anemia or a low RBC count. Babies can also experience a condition known as hydrops fetalis, where fluid starts to accumulate in spaces where fluid is normally not present. This includes spaces in the:

abdomen

heart

lungs

**Q3:** (A) What is Immunity? Explain different types of immunity

Ans 3 A) What is Immunity:

Immunity means being protected from something and being unaffected or not bothered by it. Let's say you have immunity to heat - this means heat can't bother you whatsoever - walking up to hot molten lava (about 2,000 degrees F!) would be no different than walking up to a river.

\* Types of Immunity:

\*Innate Immunity:

Plants and animals have what is called innate immunity. Innate immunity is the first line of defense against pathogens. It involves several cell types, proteins, and even an organ. The organ involved is your skin. Yes, skin is part of the first line of defense. It protects you and prevents pathogens from getting inside your body.

So, what are some ways a pathogen gets inside? Air, food, or a break in the skin are some ways a pathogen enters. A pathogen entering through food or air has mucus to go through. The mucosal surfaces prevent pathogens from attaching to cells and causing disease. A set of proteins called the complement system is also involved. The complement system attacks the pathogen and marks it for destruction.

A pathogen getting through skin and mucus will have to deal with several types of cells including phagocytes, eating cells, and natural killer (NK) cells before it can cause disease. Pathogens have warning flags on their surface that say: 'I don't belong here'.

Neutrophils, macrophages, and dendritic cells are all phagocytes. They recognize the warning flag, attack the pathogen, and eat it - a process known as phagocytosis. If a pathogen is too big for one cell alone, several cells attack at once.

NK cells on the other hand, identify infected cells (host cells) and activate the host cell's death receptor pathway or give the cell a lethal injection (injecting enzymes that degrade proteins). Host cells even try to fight back by turning off machinery that would help the pathogen and sending out distress signals.

If pathogens make it through all this, it's time for adaptive immunity to step in, and they do this with the help of dendritic cells.

Adaptive Immunity

Adaptive immunity works slower than innate, and is more specific. There are two types: passive and active. Passive immunity occurs when antibodies are passed from one person to another, as through transfusion for example.

The active immunity involves two types of white blood cells - T-cells and B-cells. Dendritic cells, after they have eaten and digested the pathogen, present the pathogen pieces to T-cells, which activates (turns on) the T-cells.

(B) What is difference between Antigen and Antibody?

Ans 3 B) Antigen:

Any substance capable of inducing a specific immune response and reacting with products of that response

\*Antibody:

Specific serum proteins produced in response to exposure to a foreign agent (i.e. disease causing agents, vaccines)attack a chickenpox virus.

**Q4:** (A) Write down different functions of Antibody

Ans 4 A) Antibody:

Antibodies, also known as immunoglobulins, are Y-shaped proteins that are produced by the immune system to help stop intruders from harming the body. When an intruder enters the body, the immune system springs into action. These invaders, which are called antigens, can be viruses, bacteria, or other chemicals. When an antigen is found in the body, the immune system will create antibodies to mark the antigen for the body to destroy.

\*Functions of Antibody:

The antibodies act sort of like the immune system's scouts. They find antigens, stick to them, and identify for the immune system the exact type of antigen so that it can be destroyed. Each antibody is made for one and only one antigen, and it's fitted with special receptors that will only bind to that antigen. For instance, a specific antibody is created to help destroy the chickenpox virus. Only that particular antibody will attack a chickenpox virus.

(B) Write difference between Primary and secondary response to an antigen

Ans 4 B) Primery response to an Antigen'

Primery response of antigens are following.

1) This occurs as a result of primary contact with an antigen.

2) Respomding cells is B\_cells and T\_cells.

3) Level of antibody reaches peak in 7 to 10 days.

4) First antibody produce is mainly lgm.

5) Antibody level declines rapidly.

\* Secondary Response to Antigens:

Secondary respone is following.

1) This occur as a result of second an subsequent exosure of the same antigens.

2) Responding cells is memory cells.

3) Level of antibody reaches peak in 3 to 5 days.

4) Takes shorter time to establish immunity.

5) Antibody level remain high for long.

**Q5:** Write difference between cell mediated and Antibody Mediated Immunity

Ans 5) Antibody Mediated Immunity:

Definition:

The immunity mediated by macromolecules found in the extracellular body fluids is called humoral immunity.

\* Mediator:

The main cemm involved in humoral immunity are B-cells

\*Components:

There are three componints.

B- cells , T- cells and macro phages.

\* Pathogen:

The humoral immunity protects against extracellular pathogens and also their toxin.

\* Antigen processing:

Do not require the processing of antigens.

\*Receptor Involved:

It involves B-cell receptor.