Final-Term Assignment

Course Title: Human Physiology II

Rad 2nd semester section A

Instructor: Dr. M .Shahzeb khan (PT)

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

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

(B) What is Erythroblastosis fetalis?

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

(B) What is difference between Antigen and Antibody?

Q4: (A) Write down different functions of Antibody

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

Q5: Write difference between cell mediated and Antibody Mediated Immunity

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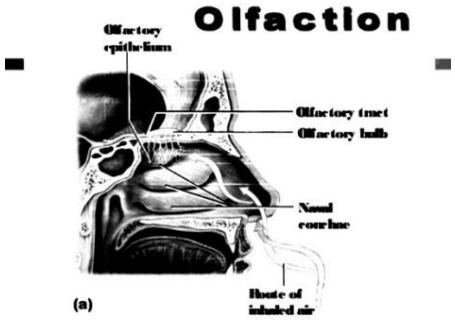
Q No1:
Ans:
The ability to smell comes from specialized sensory cells, called olfactory sensory neurons, which are found in a small patch of tissue high inside the nose. These cells connect directly to the brain. Each olfactory neuron has one odor receptor. Microscopic molecules released by substances around us—whether it's coffee brewing or pine trees in a forest—stimulate these receptors. Once the neurons detect the molecules, they send messages to your brain, which identifies

the smell. There are more smells in the environment than there are receptors, and any given molecule may stimulate a combination of receptors, creating a unique representation in the brain. These representations are registered by the brain as a particular smell.

Smells reach the olfactory sensory neurons through two pathways. The first pathway is through your nostrils. The second pathway is through a channel that connects the roof of the throat to the nose.



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Q No2:A

Ans: HAEMOSTASIS:

Is the of wound healing. This involves blood clotting. Haemostasis has three major steps: 1) vasoconstriction, 2) temporary blockage of a break by a platelet plug, and 3) blood coagulation, or formation of a fibrin clot. These processes seal the hole until tissues are repaired. Haematopoiesis is the process of forming blood cells, which occurs during embryogenesis and throughout life. Homoestasis.is the proccess by which variables are regulated so that internal conditions remain stable and relatively constant. Examples of homeostasis include the regulation of temperature and the balance between acidity and alkalinity (pH). It is a process that maintains the stability of the human

body's internal enviroresponse to changes in externals condition.

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Q No2:B

Ans: ERYTHROBLASTOSIS FETALIS is a severe medical condition that most commonly results from incompatibility between certain blood types of a woman who is pregnant and the fetus.

The condition involves a component of blood called Rh factor. Rh factor is an inherited protein, found on the surface of red blood cells. Not everyone has this protein.

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Q No3:A

Ans: IMMUNITY:

The state of being resistant to reinfection with pathogen.-The state of protection

against foreign pathogens or substances (antigens).

Type of immunity

Innate immunity We are all born with some level of immunity to invaders. Human immune systems, similarly to those of many animals, will attack foreign invaders from day one.

Passive immunity.This type of immunity is “borrowed” from another source, but it does not last indefinitely

Adaptive (acquired) immunity. This protect from pathogens develops as we go through life. Immunizations. introduces antigens or weakened pathogens to a person in such a way that the individual does not become sick but still produces antibodi

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QN.3(B)

Ans. DEFERENCE BETWEEN ANTIGONE AND ANTIBODIES:

Antigens are substances that trigger the body to cause an immune response. The body perceives antigens as harmful substances and it does its best to eliminate them by producing antibodies.What antigens do is they activate lymphocytes (white blood cells) responsible for fighting off infection. Antibodies are also known as immunoglobulins. They are proteins that have a distinct Y shape and are produced by B cells as a result of exposure to antigens.The antibody has paratope responsible for recognizing a specific epitope of antigen. It is the one responsible for antibody's lock and key binding action. What antibodies do is they get rid of antigens from the body.

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Q No4:

Ans: FUNCTIONS OF ANTIBODY

1.IgG provides long term protection because it persists for months and years after the prescence of the antigen that has triggered their production.

2.IgG protect against bacteris, viruses, neutralise bacterial toxins, trigger compliment protein systems

3.Main function of IgA is to bind antigens on microbes before they invade tissues.

4.IgA are also first defense for mucosal surfaces such as the intestines, nose, and lungs.

5.IgM is involved in the ABO blood group antigens on the surface of RBCs.

6.IgM enhance ingestions of cells by phagocytosis.

7.IgE bind to mast cells and basophils wich participate in the immune response.

QN.4(B)

Ans.: PRIMERY RESPONSE TO AN ANTIGEN

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

2.Responding cell is naïve B-cell and T-cell. .

3.Lag phase is often longer (4-7 days), sometimes as long as weeks or months.

4.Level of antibody reaches peak in 7 to 10 days.

5.It takes longer time to establish immunity.

6 First antibody produced is mainly IgM.

8 Antibody level declines rapidly.

9. Affinity of antibody is lower for its antigen

Secondary response to an antigen

1.This occurs as a result of second anssubsequent exposure of the same antigen

2.Responding cell is memory cell.

3.Lag phase is shorter (1-4 days) due to the presence of memory cell.

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

5.Takes shorter time to establish immunity.

6.Usually 100-1000 times more antibodies are produced.

8.Antibody level remain high for lonlong.

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Q No5:

Ans: ANTIBODIES MEDIATED IMMUNITY'S

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

immunity. (“humor” a medieval term for body fluid)
2.Mediator.The main cell involved in humoral immunity are B-cells.
3.Components.B cells, T cells, and macrophages. .
4.Pathogen.The humoral immunity protects against extracellular pathogens and also their toxin.
.5Antigen Processing.Do not require the processing of antigens.
6 Receptor Involved.It involves B-cell receptors (BCRs).
7.Accessory surface receptors/molecules.Igα, Igβ, Fc receptors, CD40, CD21
Cell-mediated Immunity
1.Definition.The immunity that identifies and destroys infected cells in the body is called cell-mediated immunity.

2.Mediator.The main cell involved in cell-mediated immunity are T-cells.
3.Components.Helper T cells, cytotoxic T-cells, natural killer cells, and macrophages.
4.Pathogen.The cell-mediated immunity protects against intracellular pathogens.
5.Pathogen recognition. It responds to any cell that displays aberrant MHC markers, including cells invaded by pathogens, tumor cells, or trans
6.Receptor Involved.It involves T-cell receptors (TCRs).
7.Accessory surface receptors/molecules
CD3 molecular complex
Dimer of ∑ chain, CD4, CD8, CD2, CD28

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