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## ↓ Question No(3)(B)

### ANS. Antigen

Antigen are any substance to produce antibodies.

Antigen can be bacteria, viruses, or fungi that cause infection and disease.

- 1, Generally protein but can be lipids, carbohydrates or nucleic acids.
- 2, Triggers the formation of antibodies.
- 3, There are three basic kind of antigens. (Exogenous, Endogenous, and Autoantigens).
- 4, The region of the antigen that interacts with the antibodies is called epitopes.
- 5, cause disease or allergic reactions.

## Antibody

Antibody is also called immunoglobulins (Y) shaped molecules are protein manufactured by the body that help fight against foreign substance called antibody.

Antibody are proteins. Variable sites has the antigen binding domain. These are five basic kinds of antibodies.

(M, G, E, D, and A).

The variable region of the antibody that specially binds to an epitope is called paratope.

Protects the body immobilization or lysis of antigenic material.

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## Question No (3) (A).

Ans - Immunity

The state of being resistant to reinfection with a pathogen.

The state of protection

against foreign pathogen or substance antigens.

Example -

A child infected with measles travels from Germany to United States.

Types of immunity -

Active immunity -

Individuals rely on active immunity more so that passive immunity. Active immunity is created by our own immune system. When we are exposed to a potential disease causing agent (e.g.) pathogen.

Passive immunity -

immunity in a way other than from one's own immune system can occur in a few ways and can be life saving however passive immunity is short lived because that antibodies are not continually replenished as they would be in individual whose ~~imm~~

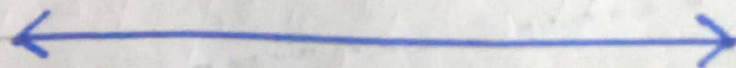
Immune System is responding directly. Passive immunity can be occur in couple of ways.

### Community immunity

immunity occurs when people are protected by those around them. This type of protection is indirect in that it does not involve physical components of immunity such as antibodies but rather when a pathogen is less likely to infect a susceptible person.

### Herd immunity

When enough people in community have been exposed to a pathogen it cannot spread as easily. As more people become immune, the pathogen has a smaller pool of people to infect. The result is that the community overall will have fewer outbreaks.



Question # No (A) (2)ANS. Haemostasis.

Haemostasis is the balance between cellulas of growth and death including human body cell cell that have matured through the normal stages of haemostatic.

Haematopoiesis.

Haematopoiesis have specific function involving infection control, oxygenation, coagulation and haemostasis.

Question # No (2 B).ANS Erythroblastosis Fetalis.

Erythroblastosis fetalis also called hemolytic disease of the newborn type of anemia in which the red blood cell erythroblastosis of a fetus are destroyed in a maternal immune reaction resulting

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from a blood group in compatibility blw these in compatibility arises when the fetus inherits a certain blood factor from the father that is absent in the mother.

QUESTION # No (4A)

ANS Function of Antibody

1. Antibodies are secreted into the blood and mucosa where they bind to and inactivate foreign substances such as pathogens and toxins neutralization.
2. Antibodies activate the complement system to destroy bacterial cells by lysis punching holes in the cell wall.
3. Antibody dependent cellular cytotoxicity (ADCC) where by an effector cell of the immune system actively lyses a target cell whose membrane surface antigen have been by specific antibodies.

4, complement mediated of pathogens or of infected cells. Antibodies activate and the complement system to destroy cells by lysis.

5, Neutralization of infectivity

6, Phagocytosis.

7, ADCC is independent of the immune complement system.

8, Antibodies facilitate phagocytosis of foreign substance by phagocytic cell opsonization.

### Question (4 B). Part

Ans. - Primary antigen:  
A primary antibody can be very useful for the detection of biomarkers for diseases such as cancer, diabetes, Parkinson's and Alzheimer's disease and they are used for the study of absorption, distribution



metabolism and excretion  
(MHC) and multi-cellular  
assistance. (MHC) of  
therapeutic agents.  
When a new pathogen  
enters the body, immune  
system takes little time  
to respond.

During the period immune  
system learns about the  
pathogen ready to  
eliminate from the body.  
Generally IgM antibodies  
with a half life of 5  
days are produced in  
primary response.

## Secondary antigen

Secondary antigen  
provides detection and  
amplification along  
with extending the  
utility of antibody  
through conjugation  
to pattern.

The secondary immune  
response occurs when  
the second time (3rd, 4th  
etc. the person is  
exposed to the same antigen.  
At this point immunological  
memory has been  
established and immune

- \* System can start making antibodies immediately
- \* Secondary antibodies are especially antibodies that bind to primary antibodies.

← Question (No 1) →

ANS

### Stimulus of Smell

- \* It is a complex process that starts with the scent being picked up by specific receptors in their noses. But until now it wasn't clear exactly how these scent signals proceeded from nose to noggin for neural processing.
- \* The cavity of these nose is lined with mucous membrane that have smell receptors connected to the olfactory nerve.
- \* The smell receptors interact with the molecules of these vapors and transmit the sensations to the brain.
- \* The sense of smell is sometimes temporarily

lost when a person has a cold.

★ Olfactory mucus Membrane:-

→ lies in the superior part of each nostril.

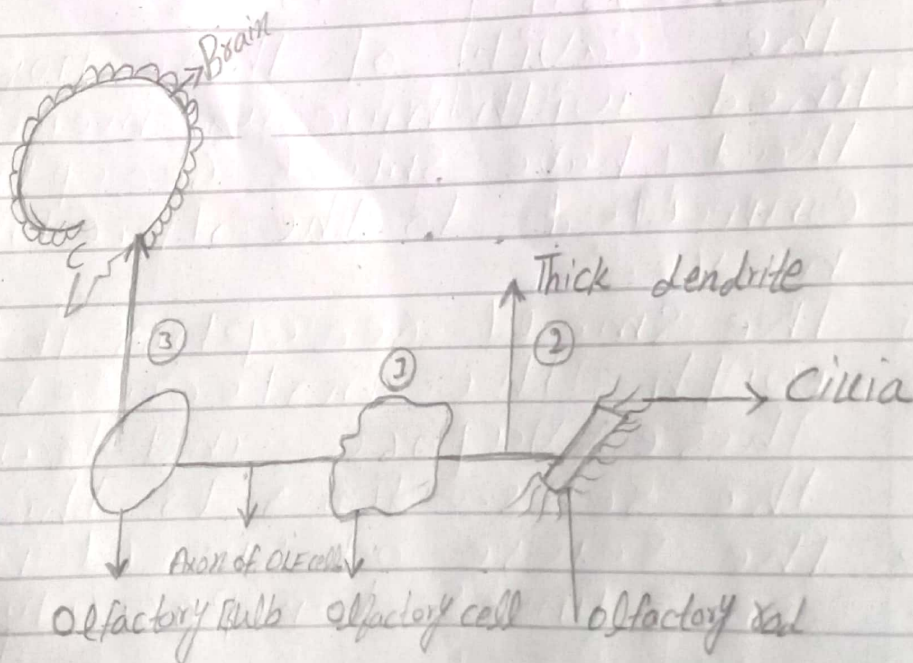
→ In each nostril the olfactory membrane has a surface area of about 24 square cm.

★ Olfactory cells.

→ 10 - to 20 million receptor cells.

→ The olfactory receptor cell for the smell sensation bipolar nerve cells.

## Structure



## Question No(5)

ANS Cell mediated

\* T lymphocytes assist the cell mediated

immunity or cellular immunity. In this type cytokines have released that help to activate

the T cells, which

further destroys the

infected cell. Likewise

the B cell - T-cell

originate in bone

marrow but matures

in the thymus and

later gets circulation

in the bloodstream

and lymphoid tissue.

\* The cell-mediated

immunity is

associated with the

T-lymphocytes and

is responsible for destroying the pathogen or microorganism which have invaded of the cells.

The one associated with T-lymphocytes helps T-cells.

natural killer cells and macrophages.

cell mediated

immunity is second line of defence.

\* Mycobacterium

tuberculosis enters the body.

\* ingested by macrophage

\* The antigen class II MCH protein

complex interact with an antigen

specific receptor on surface of helper T-lymphocyte.

Along with MHC-1 and endogenous antigens the T cells proliferate and produce the cytotoxic T-cells.

The T cells destroy the infected cell exhibiting antigens.

### ANTIBODY Mediated Immunity

Antibody mediated with assistance from helper T cells. B cell will differentiate into Plasma B cells that can produce antibodies against a specific antigen. The humoral immune system deals with antigens from pathogens that are freely circulating

as outside the infected cells.

Three cells -

Macrophage.

Helper T cells.

B-cells.

After processing by macrophages fragments of antigen appear on surface of macrophage in association with class MHC protein.

The antigen-class II MHC protein complex binds to specific receptor on surface of helper T-cell which then produce interleukins, 2, 4, 5.

These factors activate the B cell capable of producing antibodies specific for that antigen.

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\* The activated B cell proliferates and differentiates to form to from many plasma cells that secrete large amount of immunoglobulins antibody.

\* In this T cell independent only Igm is produced by cells.

\* While for IGA AND IgE require T-cell to be produced.

THE END