Immunization and Hypersensitivity

1. Define:

   Immunization – Immunization is the process of conferring specific immunity by artificial means and can involve the use of vaccines, toxoids or immune serum. If vaccines or toxoids are used, active immunity is induced, but if immune serum is used, the immunity is passive.

   Vaccine – Vaccines are substances containing killed or attenuated microorganisms (or portions of these), and are used to induce active immunity within the body. Subunit vaccines contain specific antigenic fragments of microorganisms rather than whole cells.

   Toxoid – Toxoids are substances containing detoxified microbial toxins, i.e., microbial exotoxins that have been treated so as to destroy their toxicity. Two examples of toxoids include those used to immunize people against tetanus and diphtheria.

   Hypersensitivity – A hypersensitivity reaction (also known as an allergic reaction) is an abnormal physiological state in which an immunological reaction causes tissue damage or malfunction within the body. Hypersensitivity reactions vary in severity from mildly irritating to life threatening. They represent an over-reaction or misdirected reaction of the adaptive or acquired immune system.

   Anaphylaxis – Anaphylaxis is a type I hypersensitivity reaction involving IgE and mast cells and characterized by the release of histamine body wide. This can cause changes in blood flow and capillary permeability leading to circulatory shock within a matter of minutes. It is potentially life threatening and generally taken very seriously.

2. Immunization/ toxoids/ immune serum (antiserum)

3. Vaccination/ vaccine/ toxoid

4. The disease in question is likely to spread rapidly and affect a large number of people (may cause an epidemic)/ the consequences of the disease outweigh (are likely to be more severe than) the risk of immunization.

5. Risks include: 1) Vaccines containing attenuated viruses may cause problems if administered during pregnancy. Viruses can sometimes cross the placenta and cause infections that cause damage to a developing fetus. 2) Vaccine failure may occur and can cause problems if people think they are protected and put themselves at risk. 3) Contamination of vaccines, toxoids, serum or the instruments used to administer these may occur during production or use. Although this is not likely to occur in developed countries, it can be a serious problem in other parts of the world. 4) Toxicity may be a problem, especially when vaccines contain Gram-negative bacteria. The lipopolysaccharide (LPS) materials associated with the outer membranes of Gram-negative bacteria are often toxic to mammals. 5) Vaccines, toxoids or immune serum may cause hypersensitivity reactions.

6. Contaminated with pathogenic microorganisms (including viruses)/ toxic due to LPS/ cross the placenta and infect the fetus.

7. Hypersensitivity
8. Immediate hypersensitivity (types I, II, or III)/ B-lymphocytes and antibodies (various isotypes)
9. Hypersensitivity/ cytotoxic
10. Anaphylaxis/ IgE
11. Antibodies in the isotype IgE/ histamine
12. Atopic allergy or atopy
13. Complement
14. Anti-Rh antibodies (IgG)/ complement factors (proteins)
15. Cytotoxic response/ complement
16. Arthus reaction/ serum sickness
17. Immune complex
18. Delayed hypersensitivity/ cytotoxic T lymphocytes or killer T lymphocytes (CD8)
19. Delayed hypersensitivity reactions and the activity of cytotoxic T-cells or killer T-cells
20. Exposure to bee venom or beta-lactam drugs (Penicillins and Cephalosporins)
21. Matching letter sequence is – D, C, E, H, A, G, B, and F.