

# **Swami Rama Himalayan University**

## **Syllabus for Ph.D. Entrance Examination 2017-18**

### **Immunology**

#### **Unit-I**

Principles of Immunization, Techniques for analysis of immune response. General Idea of Active and passive immunization; Live, killed, attenuated, sub unit vaccines; recombinant DNA and protein based vaccines, plant-based vaccines, reverse vaccinology; Peptide vaccines, conjugate vaccines; Hybridoma, antibodyengineering - chimeric and hybrid monoclonal antibodies; Transfusion of Immunocompetent cells; stem cell therapy; Cell based vaccines.

#### **Unit-II**

Host-pathogen interactions, Introduction to the Immune System, Cells and Organs of the Immune system, Innate immune responses Cells of the innate immune system, Inflammatory response. Components of immune system.

#### **Unit-III**

Structure and function of antibody. Inflammation, opsonization. Primary and secondary lymphoid organs. Complement. Fluorochromes and staining techniques for live cell imaging and fixed cells; immunofluorescence, immunoelectron microscopy; Flow cytometry:

#### **Unit-IV**

B cell, T cell ontogeny. Characteristics of antigen, T cell dependent and independent antigens. Hypersensitivity. Primary and Secondary immune responses. Techniques in humoral immunology. Treatment of autoimmune diseases; Transplantation – Immunological basis of graft rejection; Clinical transplantation and immunosuppressive therapy; General Idea of Tumor immunology,

#### **Unit-V**

Cytokines. T cell education, Affinity maturation. Immunological Memory. Cell-cell interaction, signal transduction. Development of tolerance. Characteristics of T helper and Tc TL and B cell peptide. Transplant immunology. Bone marrow chimera. Auto immunity, molecular mimicry, Therapy. Monoclonal antibody. Techniques in molecular immunology.