

**Swami Rama Himalayan University,  
Swami Ram Nagar, Jolly Grant, Dehradun-248016**

**Subject Code: PHDIM110**

**Subject Name: Advances in Immunology**

**100 Marks**

**TIME: 3 HRS**

**Unit-1 Immune System Physiology**

Overview, cellular basis of immune system, innate immune response, adaptive immune response, humoral immunity, antibodies, epitope, B cell receptors, cell based immunity, T cell receptors, T cell subsets, human leukocyte antigens, self and non self antigens, role of thymus, role of bone marrow, role of Lymph node, response of immune system to infections agents, immunomodulation, immunity and cancer ( Anti-tumor function of immune system, immune surveillance, immune editing, escape of cancer cells from immune surveillance, adoptive cell transfer), blood group systems, maternal immune tolerance, testicular immunology immunocontraception.

**Unit-2 Immune System Pathology**

Hypersensitivity reactions, types of hypersensitivity reaction, auto-immunity, primary immunodeficiency disorders (PIDS), HIV (AIDS), Auto-immune hemolytic anemia, neonatal jaundice, immunosuppression in sepsis.

**Unit-3 Modalities of study**

Cell counts, microscopy of stained smears, biopsy, histopathology processing, histology, immunoglobulin assay, ELISA, Western blot, radio- immunoassay, Gel card method, coombs test, crossmatchs, immunophenotype ( immunohistochemistry, flow cytometry, immunofluorescence ), electrophoresis, HPLC, immunofixation, HLA cross match, molecular

methods (PCR, FISH, CISH, microarray, ) karyotype, intracellular signaling studies cell cycle studies, cell culture, hybridoma technique, cell line, cell activation studies.

#### **Unit-4 Applications of immune system**

Cross matching in blood transfusion, artificial blood, blood transfusion reactions, vaccines types, haptens, adjuvants including recent advances like dendritic cell vaccine; immunotherapy graft versus leukemia effect; cancer cell targeted therapy, anticancer vaccines,

#### **Unit-5 Transplant and immunity**

Human leukocyte antigens (including types, function), human platelet antigens, types of graft rejection, graft versus host disease, immunomodulation, role in solid organ transplants role in bone marrow transplant.

### **References**

1. Kumar, Abbas, Fausto, Aster, ROBBINS AND COTRAN PATHOLOGIC BASIS OF DISEASE, (2010) 8/E. Saunders, Elsevier inc.
2. Punt, Owen, Stranford, (2013) KUBY immunology, 7<sup>th</sup> edition, WH freeman and company
3. Brigham Narins, (2003) World of microbiology and immunology, volume 1 and 2, Thomson and Gales publication.
4. Warren Levinson, (2008) Review of Medical Microbiology & Immunology, Tenth Edition, McGrawhill publication.
5. Arthur Rabson, lean M. Roitt, Peter J. Delves (2005) Really Essential Medical Immunology, blackwelll publishing.
6. Gabriel Virella (2007), Medical Immunology, sixth Edition, Informa health care
7. Christine Dorresteyn Stevens (2010), Clinical Immunology & Serology, third edition, FA Davis company
8. Denise M Harmening Modern Blood Banking & Transfusion Practices (2012) F.A. Davis Company