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**Syllabus for the Preliminary test for the Recruitment on the post of  
Professor, Class-I in Immuno-haematology and Blood  
Transfusion (I.H.B.T.), (Medical Education)**

Marks - 200

Questions - 200

Medium - English

**1. History of transfusion medicine**

Scientific landmarks in its development, Impact of world wars on its development, Development of PVC bags.

**2. Scientific basis of transfusion**

➤ Biochemistry & physiology of elements of blood:  
Process of cell production and life span, red cells, white blood cells, platelets;  
Red cells: Hemoglobin structure & function, Metabolic pathways, Membrane structure & function; White cells: Structure, function & kinetics; Platelets: Structure, function & kinetics; Physiology of haemostasis: Role of platelets, Coagulation pathways, Fibrinolysis; Hemodynamics of blood flow & volume, Iron metabolism, Bilirubin metabolism

➤ **Immunology**

Principles of basic immunology: Antigen, antibody, complement, immunoglobulin; Antigen antibody reaction; Lymphocytes in humoral & cellular immunity; Role of hybridoma technology in Immunohematology, Immunology of transplantation, HLA and genetic control of immune response

➤ **Genetics**

Principles of basic genetics, Genetics of blood group: Phenotype & genotype, Principles of blood group inheritance; Population genetics of blood groups

**3. Antigen systems in formed elements of blood**

Red cell antigens, Leucocyte antigens, Platelet antigens

#### 4. Blood collection, processing, component

##### A. Management of blood donation

Donor recruitment: Voluntary blood donation systems, Categories of blood donors, Education, awareness & information of prospective donor, Use of Information Technology for donor recruitment, Donor information programmes; Acceptability criteria of blood donor, Care of blood donor: Pre-donation, Mid-donation, Post-donation, Prevention & management of complications of blood donation; Blood collection: Anticoagulants & preservatives, Procedure, Blood donation camps

##### B. Blood components

Components: Types, Methods of preparation, Indications, dosage & administration; Leucodepletion: Various methods, Quality control; Storage of blood & components: Whole blood, Red cell concentrate, Plasma, Granulocyte, Cryoprecipitate; Stem cells: Peripheral blood stem cell, Cord blood, Dendritic cell; Plasma fractionation: Viral inactivation, Single donor, Pooling; Newer methods

#### 5. Pre-transfusion testing

Compatibility testing: ABO grouping & Rh typing, Antibody screening, Cross matching methods, Newer methods of cross matching: Solid phase, Gel technology; Screening for transfusion transmitted infections: Methodology, Nucleic acid amplification techniques, Newer emerging pathogens: Prions, CJ disease, Lyme disease, Others; Selection of blood, components & plasma products for transfusion

#### 6. Adverse effects of blood transfusion

Clinical presentation, pathophysiology, investigations, management: Hemolytic transfusion reaction, Non- Hemolytic transfusion reaction, Allergic, anaphylactoid and anaphylactic reactions, Alloimmunization to various elements of blood; Transfusion transmitted infections: Bacterial, Viral, Parasitic; Transfusion associated graft versus host disease, Transfusion related acute lung injury, Others: Hemosiderosis, Volume overload, Post transfusion purpura

## **7. Apheresis**

Technology of apheresis, various equipment & disposables, Haemapheresis (platelets, granulocytes, plasma, stem cells): Donor selection, Procedure, Complications; Therapeutic apheresis: Indication, procedure & complications, Plasma exchange, red cell exchange, Newer methods for immunoabsorption

## **8. Autologous transfusion**

Basic principles, indication & contra indications: Pre deposit, Haemodilution, Intra operative blood salvage including equipment, Post-operative blood salvage, Directed donation

## **9. Antenatal and neonatal transfusion practice**

Pathophysiology, diagnosis & management: Rh incompatibility, ABO & other blood group incompatibility; Exchange transfusion: Indications, methodology & complications, Neonatal transfusion practice: Strategies to reduce donor exposure, Organised donor selection, Intra uterine transfusion

## **10. Immunohaematology**

Classification, diagnosis & management: Immune hemolytic anemia, Immune thrombocytopenia, Immune neutropenia; Immunohaematological problems in multi transfused patients

## **11. Hemotherapy**

Pathophysiology, diagnosis & management of anemia, Anemia: Iron deficiency anemia, Megaloblastic anemia, Aplastic anemia, Anemia of chronic diseases, Neonatal anemia; Hereditary anemia: Thalassemia, Sickle cell anemia, Enzymopathy, Others; Pathophysiology, diagnosis and management of hemostatic disorders: Hemophilia, Von Willebrand disease, Platelet disorders: Qualitative disorders, Quantitative disorders; DIC/TTP/HIT, Acquired disorders, Others; Pathophysiology, diagnosis and transfusion support in acute blood loss: Shock, Massive transfusion; Transfusion support in surgery: General surgery, Specialised surgery Cardiopulmonary bypass/hemodialysis; Classification, diagnosis & transfusion support in oncology: Hemopoietic malignancy, Non-hemopoietic malignancy

**12. Transplantation**

Transfusion support in transplantation, Stem cell transplantation: Harvesting, Cryopreservation, CD34 counting & quality control, Infusion; Bone marrow transplantation: Harvesting, Processing, Immunohaematological problems in ABO mismatched BMT, Transfusion support BMT patients; Transfusion support in specialized conditions: Renal transplantation, Liver transplantation, Others; Irradiation of blood products: Indications, dosage, adverse effects; Tissue banking, Cord blood banking

**13. Blood substitutes and hemopoietic agents**

Crystalloids & colloids, Oxygen carrying compounds, Use of hematinics, Hemopoietic growth factors, Plasma products, Plasma Therapy

**14. Medicolegal considerations in transfusion medicine**

Ethical and legal considerations pertaining to transfusion practice, Identification of blood stains, Paternity testing, Donor notification & counseling, Look back programme, Drugs & Cosmetics Act, Accreditation, Consumer protection Act, Others

**15. Total quality management**

Development of Standard Operating Procedures (SOP) manual, Quality control: Reagents & diagnostic kits, Instruments, Personnel, Blood & components; Quality assurance: Internal quality control, External quality control; Proficiency testing: Hospital Transfusion Committee, Medical audit, Turnaround time, ISO certification/GMP

**16. Organisation & management of transfusion services**

Organisation & function of blood services & hospital transfusion practice: Recruitment & motivation, Operation of blood mobile, Development of transfusion service, Inventory control, Development of forms, labels, records, etc.

**17. Biosafety**

Personnel, Laboratory, Equipment, Sterilization, Disposal of waste material

**18. Modern biological techniques**

Principle, methods, relevance in transfusion medicine: Western blot, Polymerase chain reaction: SSCP, SSOP; Dot blot hybridization, Others – Animal experiments, museum techniques, Microarrays, Proteomics, Other new technique in Transfusion medicine

**19. Automation & computerisation**

Instrumentation, Automated blood group & processing, Automated infectious screening, Use of bar codes, Use of computer, Laboratory and hospital information system

**20. Research Methodology.**

**21. Indian Medical Council (Professional Conduct, Etiquette and Ethics)**

Regulations, 2002.

**22. Current Trends and Recent Advancements in the Field of Immuno-Haematology and Blood Transfusion.**

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