

Syllabus for the post of

**Professor, Immuno-haematology And Blood Transfusion (I.H.B.T.), Class-I
(Advt. No. 22/2023-24)**

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 immunoadsorption

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 Methodolgy.

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.