BACHELOR OF PARA MEDICAL TECHNOLOGY (BPMT)

Course Name :- Blood transfusion

Learning Objectives

By the end of the course, the student should be able to :

1. Describe the blood group systems
2. Permorm blood grouping and cross matching.
3. Describe Physiology of blood
4. Prepare blood components.
5. Enumerate various Transfusion transmitted infections.
6. Perform test for its diagnosis of transfusion transmitted infections.
7. Demonstrate safe disposal of biomedical waste.
8. Describe FDA guidelines and legal aspects of blood banking.
9. Maintain blood bank records and instruments.
10. Describe tests for quality control in blood bank.
11. Perform tests for quality control in blood bank.
12. Describe the basics of problem solving in blood grouping and cross matching.
13. Describe the steps of sample collection and workup required in transfusion reaction.
14. Collect blood using correct techniques during a camp.
15. Perform necessary paperwork for conducting the camp.
16. Explain the concepts of biosafety and ethical issues.

BACHELOR OF PARA MEDICAL TECHNOLOGY (BPMT)

Course Name :- Blood transfusion

1st Year: Assessment System & Syllabus

Sr. No	Paper	Subject	Subject Code	Theory			Practical			Total Marks
				IA	Final	Total	IA	Final	Total	
1	Paper – I	Basic Sciences		30	60	90	30	80	110	200
2	Paper – II	Introduction to transfusion technology, Lab management		30	60	90	30	80	110	200
3	Paper - III	Introduction to blood bank, Legal aspects		30	60	90	30	80	110	200

Paper – I
Subject :- Basic Sciences

Sr. No.	Topics	Lect/demo Hours	
	Anatomy		
1	Introduction to Anatomy	2	1
2	Introduction to various body parts and systems	2	1
3	Anatomy & Functions of respiratory System (Only Organ nomenclature and brief functions)	2	2
4	Anatomy & Functions of cardiovascular system (Only Organ nomenclature, important arteries and veins / sites for venepuncture and brief functions)	2	2
	Physiology		
1	Organization of Human body, cell	2	1
2	Composition and functions of blood	2	2
3	Introduction to transfusion technology	2	-
4	Role and responsibilities of transfusion technician	2	-
5	General precautions in laboratory	2	-
6	Laboratory safety measures	2	-
7	Biological specimens and their types	2	-
8	Methods of collection of biological specimens	2	2
9	Preservation and disposal of biological specimens	2	-
10	Modes of transmission of diseases	2	-
11	Control and prevention of infections	2	-

Paper – II

Subject :- Introduction to transfusion technology, Lab management

Sr. No.	Topics	Lect/ demo Hours	Practical
1	Introduction to transfusion: Role and responsibility of transfusion technician, safety measures and first aid.	2	-
2	Cleaning and care of general laboratory glassware and equipment. Principles, functions and uses of balances, centrifuge machines, colorimeters.	2	1
3	Collection and recording of biological specimens, separation of serum plasma preservation and disposal of biological samples/materials	2	2
4	Laboratory Management and Planning. The reception and recording of specimen, cataloguing and indexing maintenance of laboratory records.	2	-
5	Introduction to microbiology lab, various types of specimens received	2	-
6	A knowledge of working and maintenance of the following Incubators, Refrigerators, Water baths, Ovens, Steamers, Autoclaves, Inspissator, Centrifuges, Vaccum Pumps, Water Steel. Cleaning and sterilization of syringes and needles. Sample glass wares.	2	-
7	Sterilization: Methods of sterilization and their uses. Chemical, dry heat, steam sterilization, Tyndallization, filtration, sterilization by ultraviolet light.	2	1
8	Care and use of microscope. Dark ground illumination, fluorescence and microscopy.	2	-
9	Introduction and scope of Pathology	1	-
10	Introduction to Pathology lab, various types of specimens received	1	-
11	Laboratory Management and Planning. The reception and recording of specimen, cataloguing and indexing maintenance of laboratory records . Methodology and importance of labeling and registration of sample for various investigations	1	-
13	General principles of Haematology techniques collection, fixation, processing & routine staining, Haemoglobin, TLC, DLC, Peripheral smear, automatic cell counter	2	3
14	General principles of Blood Bank techniques antigen, antibody, ABO & Rh system	2	1
15	Systemic Pathology, basis and morphology of common disorders like anemia, leukemia, AIDS, TB, Hepatitis & malaria.(laboratory findings)	2	-
16	Maintenance and medico legal importance of records and specimens.	2	-

Paper – III

Subject :- Introduction to blood bank, Legal aspects

Sr. No.	Topics	Lect/demo Hours	Practical
1	Introduction to blood bank Overview ,Staff and their role , MSBTC and FDA	2	1
2	Instruments, equipments used in blood bank List of instruments and their uses , general care and protocol of use, quality control.	2	1
3	General care of instruments Principles of general care of instruments, methodology of cleaning of glassware	2	2
4	Record keeping in blood bank: various records in blood bank , method of record keeping	2	-
5	Work flow in blood bank a. Criteria for blood donation b. Procedure of blood donation c. Blood collection and its storage d. Component separation and its storage e. Blood serological testing f. Issuing of blood components g. Transfusion reactions and its lab investigations	4	2
7	Role of NGO	2	-
8	Legal aspects related to blood bank	2	-
9	Donor motivation Blood donation camp – how it is organized and staff required for conduction of blood camp and their role.	2	-
10	Preservation& storage of blood for transfusion and storage effects Different blood components- their method of preparation, temperature of storage and shelf life.	2	-

All lectures and practicals are covered in the rotational posting in Dept. of Pathology

BACHELOR OF PARA MEDICAL TECHNOLOGY (BPMT)

Course Name :- Blood transfusion

2nd Year: Assessment System & Syllabus

Sr. No	Paper	Subject	Subject Code	Theory			Practical			Total Marks
				IA	Final	Total	IA	Final	Total	
1	Paper – I	Clinical pathology, biochemistry and general lab methods		30	60	90	30	80	110	200
2	Paper – II	Elementary microbiology & serology		30	60	90	30	80	110	200
3	Paper – III	Elementary haematology		30	60	90	30	80	110	200

Paper – I

Subject :- Clinical Pathology, Biochemistry and General Lab Methods

Sr. No.	Topics	Theory Hours	Practical Hours
	CLINICAL PATHOLOGY		
1	Routine examination of urine for sugar	1	1
2	Examination of urine for Protein, Sp. Gravity	1	1
3	Urobilinogen	1	1
4	Examination of urine for bile salt & bilepigment	1	1
5	Microscopic examination of urine	1	1
6	Examination of faeces including test for occult blood	1	1
	ELEMENTARY BIOCHEMISTRY		
1	Atomic weight, molecular weight and equivalent wt	1	
2	Preparation of normal solution & molecular solution	1	1
3	Preparation of stock& buffer solution	1	1
4	Acids & Alkalies	1	-
5	Ph & its determination	1	1
6	Chemical balance & measuring cylinders	1	-
7	Photoelectric Colorimeter	1	1
8	Introduction of flame photometer & polarimeter	1	1
9	Quality control tests– Internal and External Laboratory Quality Control	2	-
	General Laboratory Methods /Equipments		
1	Refrigerator	2	-
2	Centrifuges	2	-
3	Water bath	2	-
4	Electrophores is apparatus	2	1
5	Biosafety measures	2	-

Paper – II

Subject :- Elementary Microbiology& Serology

Sr. No.	Topics	Theory Hours	Practical Hours
1.	Classification of Bacteria, sources of infection, Prevention of contamination	2	1
2.	Gram staining	2	1
3.	Acid–Fast bacilli & Ziehl Neelson staining	2	1
4.	Staining for blood borne parasites	2	1
5.	Hepatitis B & C viruses	2	1
6.	HIV Viruses I &II	2	1
7.	Antigen & Antibody	2	1
8.	Antigen Antibody reactions and factors affecting them	2	1
9.	HIV antibody test(HIV- I &II)	2	1
10.	Test for HBs Ag, HCV,CMV & Toxoplasma	2	1
11.	VDRL/ RPR Test	2	1

Paper – III

Subject :- Elementary Hematology

Sr. No.	Topics	Theory Hours	Practical Hours
1	Collection of capillary& venous blood and anticoagulants	01	-
2	Estimation of haemoglobin by copper sulphate (CuSO4), Sahlis and Cyanmeth Hb method	2	2
3	Estimation of packed cell volume and ESR	1	2
4	Estimation of total leucocytecount	1	2
5	Preparation and staining of peripheral blood smear	1	2
6	Examination of peripheral smear for parasites	1	1
7	Estimation of differential leucocyte count	1	2
8	Estimation of platelet count	1	1
9	Estimation of glucose six phosphate dehydrogenase	1	-
10	Detection of foetal cells in meternal circulation	1	-
11	Haemoglobinopathies	2	-
	a. Abnormal haemoglobinopathies , thalassaemia & sickle cell anaemia.	2	-
	b. Alkali denaturation test	2	-
	c. Test for sickling	2	-
	d. Haemoglobin electrophoresis	2	-
	e. Estimation of plasma haemoglobin	2	-
12	Mechanism of coagulation of blood	2	-
13	Collection & handling of blood samples for coagulation studies.	2	-

BACHELOR OF PARA MEDICAL TECHNOLOGY (BPMT)

Course Name :- Blood transfusion

3rd Year : Assessment System & Syllabus

Sr. No	Paper	Subject	Subject Code	Theory			Practical			Total Marks
				IA	Final	Total	IA	Final	Total	
1	Paper – I	Clinical hematology and ward work		30	60	90	30	80	110	200
2	Paper – II	Screening, grouping before blood transfusion		30	60	90	30	80	110	200
3	Paper – III	Transfusion reactions, Recent advances in transfusion		30	60	90	30	80	110	200

Paper – I
Subject: - Clinical Hematology and ward work

Sr. No.	Topics	Theory Hours	Practical Hours
1	Circulatory System	2	1
2	Pulse, heart rate, blood pressure, temperature, respiratory rate	2	2
3	Respiratory System	2	2
4	Vene puncture	1	1
5	Shock and resuscitation	2	2
6	Anaphylaxis	1	1
7	Vaso vagal reaction	1	1
8	Intubation and Resuscitation in the ward	2	2
9	I V Fluids	1	1
10	Simple definitions of clinical terms & diseases : anaemia , blood diseases, cancer, hepatititis, HIV, malaria.	2	2

Paper – II
Subject: - Screening, grouping before blood transfusion

Sr. No.	Topics	Theory Hours	Practical Hours
1	Blood groups in general and their importance	1	1
2	ABO Blood group system & subgroups	1	1
3	ABO Blood group in by various techniques	1	1
4	Rh Blood group system	1	1
5	Rh Blood group in gpheno type & genotype	1	1

6	Detection of D^uantigen	1	1
7	Compatibility test	2	2
8	Preparation of serum, cell suspension (various percentages) and washing of RBC's	2	2
9	Antiglobulin Test (DAT&IAT)	1	2
10	Detection of Immuneanti bodies including Rh antibodies, elution of antibodies	1	2
11	Titration of Anti A, Anti B &Anti D anti sera	1	1
12	Detection & Titration of Immuneanti bodies Anti A, Anti B	1	1
13	Compatibility test in AIHA	1	1
14	Blood donor motivation propaganda	1	1
15	Selection& bleeding of donors	1	1
16	Adverse reactions in blood donors & the irmanagement	1	1
17	Preservation& storage of blood for transfusion and storage effects	1	1
18	Hazards of blood transfusion; Transfusion transmitted diseases	1	2
19	Investigation of transfusion reactions	1	2
20	Blood component therapy	1	1
21	Preparation of various blood components &their Quality control	1	1
22	Composition and fractions of plasma	1	1
23	Indications of blood& blood component transfusion	1	-
24	Auto logous transfusion	1	-
25	Organization of blood bank services & FDA Licensing of Blood Bank	1	-
26	Disposal of infected blood units and other infected material Disposable blood and fluid administration sets–components and Quality control	2	2
27	Crystalloid and colloid solutions	1	1
28	Principles and various methods of sterilization	1	-
29	Glassware & rubber it emsused in Transfusion medicine-cleaning and maintenance	1	1
30		1	1
31	Elisa Reader- functions, operation and maintenance	2	3
32	Introduction to cell separator-functions, operation and maintenance	2	2
33	Introduction to Stem cells, sources, collection and Cryopreservation	2	1

Paper – III

Subject: - Transfusion reactions, Recent advances in transfusion

Sr. No.	Topics	Theory Hours	Practical Hours
1	Preparation and maintenance of emergency tray	**1**	**1**
2	Maintenance and checking of instruments, equipments used during transfusion reactions	**1**	**2**
3	Recent advances in transfusion technology	**1**	**-**

BACHELOR OF PARA MEDICAL TECHNOLOGY (BPMT)

Course Name :-Blood transfusion

List of Suggested Books for reading

Sr. No.	Subject / Topic	Author/ Editor	Title of Book	Publisher
1	Reference manual	AABB	Manual of American Association of blood banking	American Association of blood banking
2	Blood banking	DGHS	Blood banking : DGHS manual	Govt. of India
3	Blood banking and medical laboratory technician	Prafulla Godkar & Darshan Godkar	Textbook of medical laboratory technician	Jaypee Publishers
4	Medical laboratory technician	Kannai and Mukherjee	Medical laboratory technician and procedure manual	Tata Mcgraw Hill education Pvt Ltd
5	Laboratory technology	Ramnik Sood	Laboratory technology Methods and Interpretation	Jaypee Publishers