

[LF 0212]

AUGUST 2014

Sub.Code :1321

**B.Sc. DIALYSIS TECHNOLOGY
THIRD YEAR
PAPER I – DIALYSIS TECHNOLOGY**

Q.P. Code: 801321

Time: Three hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3x10=30)

1. List components of a Water treatment plan for a dialysis unit in sequence with suitable diagrams. Write in detail about the following components: Carbon filter, Reverse osmosis and the Deionizer.
2. Define sustained low efficiency dialysis (SLED). Write in detail about the clinical indications, dialysis settings, anti coagulation protocol, advantages and disadvantages and complications of SLED.
3. Classify dialyzer types and membranes. Define and detail the following dialyzer specifications with examples: KUF, Urea Clearance, KOA and Priming Volume.

II. Write notes on:

(8x5=40)

1. What are the causes and consequences of hypotension during dialysis? Write briefly on the steps to manage hypotension during dialysis.
2. What is access recirculation? How is it assessed and managed?
3. Write briefly on the various heparin based anticoagulation protocols for hemodialysis
4. How do you measure adequacy of hemodialysis?
5. Write briefly about Clinical features, lab investigations and management of CAPD peritonitis.
6. Write briefly on online hemodiafiltration
7. What is high flux dialysis? How is it different from high efficiency dialysis?
8. Write briefly about the machine monitoring during hemodialysis

III. Write answers on:

(10x3=30)

1. Care of venous dialysis catheters
2. Choosing a dialysis modality for poisoning
3. Tests for dialyzer performance after reuse
4. Post dialysis evaluation of a patient undergoing acute hemodialysis
5. Plasma volume calculation
6. Alarms in the hemodialysis circuit.
7. Dietary recommendation of Potassium, Phosphate and Protein in hemodialysis patients
8. Nocturnal daily hemodialysis protocol
9. Sodium Modelling in hemodialysis
10. Precautions in dialyzing a patient with hepatitis B virus infection

[LG 0215]

FEBRUARY 2015
B.Sc. DIALYSIS TECHNOLOGY
THIRD YEAR
PAPER I – DIALYSIS TECHNOLOGY

Sub.Code :1321

Q.P. Code: 801321

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 = 30)

1. Define the three main principles of dialysis. Define, write the steps of measurement, the formulae for calculation and the interpretation Urea reduction ratio and Kt/V in the assessment of adequacy of dialysis. What are the clinical symptoms and signs of inadequate dialysis?
2. List and detail the various anticoagulant protocols and monitoring in in hemodialysis. Write briefly on newer anticoagulants and their use in hemodialysis.
3. Define continuous renal replacement therapy (CRRT). List the different types and the differences between them. Draw and explain the typical CRRT circuit. Write briefly about the heparin, citrate protocols and regional citrate anti coagulation in CRRT. Write briefly about the pre and post dilution methods of fluid replacement.

II. Write notes on:

(8 x 5 = 40)

1. Write briefly on dialyzer reactions.
2. Write briefly on acute dialysis prescription detailing the principles behind it.
3. Write briefly on dietary advice to patients on haemodialysis.
4. Write briefly on differences between centrifugal and filtration plasmapheresis. What is double filtration plasmapheresis?
5. Write briefly on quality assurance in hemodialysis
6. Write briefly on the different types of dialyzer membranes.
7. Write briefly on protocol for maintenance of hemodialysis machines.
8. Write briefly on temporary versus permanent dialysis venous access catheters.

III. Write answers on:

(10 x 3 = 30)

1. Carbon filter in water purification.
2. Complications of central venous catheterisation.
3. Protocol and Role of Hepatitis B vaccination in HD patients.
4. First use syndrome in haemodialysis.
5. Dialysis management of Lithium poisoning.
6. Complications of plasmapheresis.
7. Extra corporeal Immunoabsorption.
8. Ultrafiltration failure in peritoneal dialysis.
9. High flux dialysis.
10. Automated versus manual reuse of dialyzers.

[LH 0815]

AUGUST 2015

Sub.Code :1321

B.Sc. DIALYSIS TECHNOLOGY
THIRD YEAR
PAPER I – DIALYSIS TECHNOLOGY
Q.P. Code: 801321

Time: Three Hours

Maximum : 100 Marks

Answer All questions

I. Elaborate on:

(3 x 10 = 30)

1. Define nephritic and nephritic syndromes? What are the differences between the two? Give four examples each? How will you investigate these conditions and what are the management principles?
2. What are the various modalities of renal replacement therapy? Describe each modality, its indications, advantages and disadvantages in detail.
3. Elaborate the components of the water treatment plant. What are the uses and indications of each component? How will you set this up in your dialysis unit?

II. Write Notes on:

(8 x 5 = 40)

1. Write about dialysis adequacy tests and the targets for hemodialysis and peritoneal dialysis.
2. Define chronic kidney disease and enumerate the stages.
3. Write the composition of the dialysate used in hemodialysis.
4. What are high flux and high efficiency dialysers?
5. What are the patient monitoring parameters before, during and after hemodialysis.
6. How do you diagnose peritoneal dialysis related infections?
7. Write about the Tamil Nadu deceased donor programme.
8. Define primary and secondary hypertension and list the causes of secondary hypertension.

III. Short Answers on:

(10 x 3 = 30)

1. Write on the physiology of peritoneal dialysis.
2. Write on dietary management of hemodialysis patients.
3. What is Slow Low Efficiency Dialysis?
4. What are the conventional indications for mechanical ventilation?
5. Why is heparin used in hemodialysis? How do we monitor heparin and warfarin anticoagulation during hemodialysis?
6. How do we perform basic cardiac life support?
7. Write about citrate anticoagulation in hemodialysis.
8. Define diffusion and osmosis with diagrams.
9. What are the causes of intra-dialytic hypotension?
10. Define hyponatremia and classify?

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Time: Three Hours**Maximum : 100 Marks****Answer All questions****I. Elaborate on:****(3 x 10 = 30)**

1. Define plasmapheresis. What are the methods for performing plasmapheresis? How will you monitor a patient on plasmapheresis? What are the indications for plasmapheresis? What are the different replacement fluids?
2. What are the types of vascular accesses for hemodialysis? Give the advantages and disadvantages of arterio-venous fistula versus arterio-venous graft. What are the indications for temporary hemodialysis access and mention the various temporary accesses?
3. Define hypertension. What are the different stages of hypertension? What is primary hypertension? Give some causes of secondary hypertension. How will you investigate a case of hypertension? What are some of the common medications used in the treatment of hypertension?

II. Write Notes on:**(8 x 5 = 40)**

1. How will you give dietary counseling to a CKD patient not on dialysis and to a CKD patient on hemodialysis?
2. What are the common complications seen in patients during the hemodialysis sessions and how will you treat them?
3. Mention the non infectious complications of peritoneal dialysis.
4. Explain with diagram the physiology of the peritoneal membrane.
5. What is sodium modeling? What are the different methods of sodium modeling?
6. What are the different types of AV fistula recirculation? How will you diagnose recirculation?
7. Define hypokalaemia. What are the common causes of hypokalaemia? What are the clinical manifestations of hypokalaemia?
8. What is renal allograft and who are the usual kidney donors in our country?

III. Short Answers on:**(10 x 3 = 30)**

1. How will you calculate urea reduction ratio and KT/V?
2. What are bio-compatible dialyzers? Give three examples.
3. Define acute kidney injury. What are the indications of dialysis in acute kidney injury?
4. Explain the various common causes of obstructive nephropathies.
5. What is reverse osmosis? What is its role in water treatment?
6. Explain Continuous Renal Replacement Therapy?
7. What are the universal precautions to be taken in a dialysis unit?
8. What are the methods of dialyzer reuse?
9. What is the composition of standard peritoneal dialysis fluid?
10. Explain Slow Continuous Ultra Filtration.

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. What are the indications of Continuous Renal Replacement Therapy? Write about its various modalities.
2. Explain the anticoagulation techniques used in Hemodialysis.
3. Write about acute complications of hemodialysis.

II. Write notes on: **(8 x 5 = 40)**

1. List the principles of hemodialysis and explain diffusion.
2. How to prevent catheter related infections in hemodialysis unit?
3. Write about depression in dialysis patients.
4. Write about the synthetic membranes used in dialyzers.
5. What are all the clinical manifestations of inadequate dialysis?
6. List the causes of malnutrition in dialysis patients.
7. How to maintain a cadaver donor?
8. List the infectious and non infectious complications of Peritoneal dialysis.

III. Short answers on: **(10 x 3 = 30)**

1. What are all the steps in dialyzer reprocessing?
2. Write about the vascular access in infants and children.
3. Write about the standard composition of dialysate used for hemodialysis.
4. What are all the steps in water treatment for Hemodialysis?
5. Write about pre dialysis patient assessment.
6. Write about continuous ambulatory peritoneal dialysis.
7. What are all the possible contaminants in source water?
8. List out various alarms and their causes in hemodialysis.
9. Write the advantages and disadvantages of Arterio venous fistula.
10. Write about the assessment of vascular access prior to starting hemodialysis.

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Define Acute Kidney injury. Write about its causes, diagnosis and management?
2. Write about the signs and symptoms, causes and management of intra dialytic hypotension.
3. Write about pre, intra and post dialysis patient monitoring. Add notes on the machine alarms and their causes.

II. Write notes on: **(8 x 5 = 40)**

1. What are all the major causes of Chronic kidney disease (CKD)? Add a note on stages of CKD.
2. What are all the types of renal stones? How to diagnose renal stone diseases?
3. List the congenital anomalies of kidney and urinary tract.
4. Write about the principles of peritoneal dialysis and the factors affecting them.
5. List the non infectious complications of peritoneal dialysis.
6. How to prevent catheter related infection in a hemodialysis unit?
7. List the modalities of Continuous renal replacement therapies and explain about Continuous Veno Venous Hemodiafiltration.
8. What are the indications of plasmapheresis? Name the replacement fluids used in plasmapheresis.

III. Short answers on: **(10 x 3 = 30)**

1. Name some common medications used in dialysis patients and their uses.
2. What are all the different modalities of Continuous renal replacement therapies?
3. Name four common bacteria that cause urinary tract infection.
4. List the groups of antihypertensive drugs.
5. Write the advantages of dialyzer reprocessing.
6. Classify dialyzer membranes.
7. Name any four complications of permanent vascular access?
8. What are all the principles of hemodialysis?
9. What are all the clinical manifestations of inadequate dialysis?
10. Tabulate the composition of dialysate used for hemodialysis.

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Define chronic kidney disease. Write about its causes, diagnosis and management. List few of its clinical manifestations.
2. What are all the acute complication of hemodialysis? Add a note on dialysis disequilibrium syndrome?
3. How to prevent infection and related problems in a dialysis unit? Add notes on vaccination in dialysis patients and staffs.

II. Write notes on: **(8 x 5 = 40)**

1. Write about the depression in dialysis patients.
2. What are all the tests to be done in donor and recipient workup for renal transplantation?
3. How to prevent clotting in extracorporeal circuit?
4. What are all the indications of heparin free dialysis?
5. What are all the types of peritoneal dialysis?
6. List the insertions related complications of catheters.
7. Write the causes, diagnosis and management of obstructive nephropathy.
8. Write about the signs and symptoms, diagnosis and treatment of urinary tract infections.

III. Short answers on: **(10 x 3 = 30)**

1. Tabulate the five stages of CKD.
2. What are the medical complications of Renal transplantation?
3. How to manage air embolism in a patient during hemodialysis?
4. What to check in a patient before starting hemodialysis?
5. What are all the common veins used for central venous catheters in hemodialysis patients?
6. Write about the complications of arterio venous fistula.
7. What are the pre renal causes of acute kidney injury?
8. Name any four congenital anomalies of the urinary tract.
9. Name any five most commonly used medications dialysis unit.
10. What are the indications of hemodialysis?

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Draw a nephron and explain the parts and functions of a nephron in detail.
2. Classify water soluble vitamins and explain in detail about each of them.
3. Define neoplasia. Compare and contrast the features of benign and malignant tumors in detail.

II. Write notes on:

(8 x 5 = 40)

1. What are the methods available for haemoglobin estimation and explain in detail about Sahli's method of haemoglobin estimation?
2. What do you mean by ESR? How do you estimate the ESR by Westergren's method?
3. Circulatory shock.
4. What are leucocytes? Classify them and explain in detail about the morphology and function of granulocyte.
5. How is a cerebrospinal fluid analysis done? Compare and contrast the CSF findings in different types of meningitis.
6. Describe the role of kidney in maintaining acid base balance.
7. Brief account on menstrual cycle.
8. Renal dialysis.

III. Short answers on:

(10 x 3 = 30)

1. Name six agents that cause cell injury.
2. What are the outcomes of acute inflammation?
3. Consequences of defective inflammation.
4. Name four tumor causing viruses.
5. Name four conditions that cause neutropenia.
6. Name two conditions that is associated with decreased platelet count.
7. What are different types of RNA?
8. Auscultatory areas.
9. Erythropoiesis.
10. Rh factor.

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Explain about complications during hemodialysis and its management.
2. What are psychologic problems and psychosocial issues in the ESRD population?
3. What is peritoneal dialysis? Explain about its complications.

II. Write notes on: **(8 x 5 = 40)**

1. Write a short note on hemodialysis.
2. What is the composition of standard hemodialysis solution? What is Dual – concentrate system?
3. What are the types of permanent access for hemodialysis and its complications?
4. What are the factors favouring clotting of the extra-corporeal circuit? What are the signs of clotting in the extra-corporeal circuit?
5. Explain CAPD exchange procedure of double bag system.
6. What are the potential routes of infection in peritoneal dialysis?
7. What is GFR? What are the stages of CKD?
8. What are the acute dialysis indications for infants and children?

III. Short answers on: **(10 x 3 = 30)**

1. What is the surface area (m²), priming volume, Kuf (ml/hr/mmhg), membrane of F6HSP and F8HSP?
2. What is inter dialytic hypotension?
3. What are principles of peritoneal dialysis?
4. What is the use of inj. Heparin in peritonitis?
5. What are the pre and post patient assessment in hemodialysis?
6. What do you mean by online sodium clearance?
7. What is the replacement solutions used in plasmapheresis? What are its advantages and disadvantages?
8. Write a note on management and prevention of muscle cramps during hemodialysis?
9. What are the precautions you will take while doing hemodialysis for HIV patient?
10. What are the criteria of donor selection?

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. What are the types of central venous catheterization and explain about its complications in detail?
2. Explain in detail about dialyzer reusing process.
3. Write in detail about acute hemodialysis prescription.

II. Write notes on: **(8 x 5 = 40)**

1. Write a note about monitors and alarms in hemodialysis machine.
2. What is disequilibrium syndrome? How will you manage it?
3. What are dialyzer reactions?
4. Explain about continuous hemofiltration, continuous hemodiafiltration, SCUF.
5. What is PET? Explain the transport characteristic of peritoneum.
6. What are the mechanical complications of peritoneal dialysis?
7. What is the daily dietary recommendation for hemodialysis and peritoneal dialysis patient for protein (g/kg), calories, carbohydrate, fat, sodium, potassium, phosphorus?
8. What are the potential indications for plasmapheresis?

III. Short answers on: **(10 x 3 = 30)**

1. What is priming volume?
2. What are the complications during hemodialysis?
3. Write about three-pore model of peritoneal transport.
4. What is Tidal peritoneal dialysis?
5. What are the signs and symptoms of peritonitis?
6. What are the functions of softener in R.O. plant?
7. How to prevent interdialytic hypotension during hemodialysis?
8. What is SCUF?
9. What are the risks and complications of kidney transplant (recipient)?
10. What is the significance of thymoglobulin in renal transplantation?

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Mention the various modes of renal replacement therapy. Indications, advantages and disadvantages of each mode of renal replacement therapy.
2. Draw, label and explain the hemodialysis circuit.
3. Elaborate the causes of anaemia in a patient on hemodialysis and management.

II. Write notes on: **(8 x 5 = 40)**

1. Adequacy of hemodialysis.
2. Peritonitis in peritoneal dialysis patient.
3. Causes of hypotension during HD.
4. Water treatment plant.
5. Hemodialfiltration.
6. Reuse of dialyzer.
7. Management of hyperkalemia.
8. Plasmapheresis.

III. Short answers on: **(10 x 3 = 30)**

1. Vaccinations given in Dialysis patients.
2. Steps in hand hygiene.
3. Ultrapure water.
4. Causes of fever during dialysis.
5. Peritoneal equilibration test.
6. Techniques used to cannulate AV fistula.
7. Newer Peritoneal dialysis fluids.
8. First use syndrome.
9. Catheter related blood stream infection.
10. Indications for CRRT.

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Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(3 x 10 = 30)

1. Define Acute kidney injury (AKI). Classification and causes of AKI. Indications for dialysis.
2. Anticoagulation techniques in hemodialysis.
3. Approach to peritonitis in a peritoneal dialysis patient.

II. Write notes on:

(8 x 5 = 40)

1. Access recirculation.
2. Adequacy of hemodialysis.
3. Plasmapheresis.
4. Acute peritonitis in CAPD patient.
5. Adequacy of Dialysis.
6. Causes of fever in a dialysis patient and management.
7. Reuse of dialyzers.
8. Mention various Iron preparations. Complications of using iron injections.

III. Short answers on:

(10 x 3 = 30)

1. Causes of anaemia in dialysis patient.
2. Ultrafiltration failure in Peritoneal dialysis.
3. Indications for SLED.
4. Dialysis disequilibrium syndrome.
5. AV fistula cannulation techniques.
6. Complication of chronic hemodialysis.
7. Care of permanent HD catheter.
8. Causes of PD outflow failure.
9. Management of hyperkalemia.
10. Indications for CRRT.

B.Sc. DIALYSIS TECHNOLOGY
THIRD YEAR (Regulation from 2010-2011)
PAPER I – DIALYSIS TECHNOLOGY
Q.P. Code: 801321

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on: **(3 x 10 = 30)**

1. Define Chronic Kidney Disease. Discuss the common causes of Chronic Kidney Disease in our Indian population? What are the stages of Chronic Kidney Disease and brief about the modalities of renal replacement therapy?
2. What are the types of Arterio Venous access? Why AV fistulas are better than grafts? How do you monitor AV fistula dysfunction?
3. List components of a water treatment plan for a dialysis unit with a sequential diagram. What are the standards and recommendations of water quality used for dialysis?

II. Write notes on: **(8 x 5 = 40)**

1. Enumerate the steps in dialysis reprocessing and discuss about the dialyzer reactions.
2. Describe in brief about the Hemodialysis apparatus? What are the monitors and alarms in the Hemodialysis machine?
3. What is plasmapheresis? What are the types of plasmapheresis and its indications?
4. What is the high flux dialysis and high efficiency dialysis?
5. Discuss the treatment modalities of dialysis for Acute Kidney injury. Mention their advantages and disadvantages?
6. Enumerate the physiology, principles, and types of peritoneal dialysis?
7. What is meant by adequacy of dialysis? How do you measure adequacy in hemodialysis and peritoneal dialysis?
8. Mention the complications of peritoneal dialysis?

III. Short answers on: **(10 x 3 = 30)**

1. Define nephritic syndrome?
2. What is slow Efficiency Dialysis and mentions few indications for SLED?
3. What are long term complications of Hemodialysis?
4. Precautions for dialyzing a patient with Hepatitis B virus infections?
5. Define intra dialytic hypertension and how do you manage hypertension during hemodialysis?
6. What is hybrid dialysis?
7. Dietary recommendations of patients on hemodialysis and peritoneal dialysis.
8. What is dry-weight? How do you assess dry weight in dialysis patients?
9. What is the role of therapist in rehabilitation of patient on dialysis?
10. Name some newer Peritoneal dialysis solutions.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[AHS 0423]

APRIL 2023

Sub. Code: 1321

**B.Sc. DIALYSIS TECHNOLOGY
THIRD YEAR (Regulation 2010-2011 onwards)
PAPER I – DIALYSIS TECHNOLOGY**

Q.P. Code: 801321

Time: Three Hours

Maximum: 100 Marks

Answer all questions

I. Elaborate on:

(30 x 1 = 30)

1. What are the types of Vascular accesses for Hemodialysis? Give the advantages and disadvantages of Arterio-Venous Fistula versus Arterio-Venous Graft.
2. Define Continuous Renal Replacement Therapy (CRRT). What are the indications for CRRT? List the different types and the differences between them. Draw and explain the typical CRRT circuit.
3. Explain the anticoagulation techniques used in Hemodialysis.

II. Write notes on:

(8 x 5= 40)

1. Alarms in the hemodialysis circuit. What is normal venous pressure? What are the causes of high venous pressure alarms?
2. Write briefly on online haemodiafiltration.
3. Diagnosis and management of CAPD peritonitis.
4. What are the causes and consequences of hypotension during dialysis? Write briefly on the steps to manage hypotension during dialysis.
5. Write briefly on dialysis prescription in patients with AKI detailing the principles behind it.
6. Write briefly on the different types of dialyzer membranes.
7. Carbon filter in water purification.
8. First use syndrome in haemodialysis.

III. Write answer on:

(10 x 3 = 30)

1. Complications of central venous catheterization.
2. Tests for dialyzer performance after reuse.
3. Post dialysis evaluation of a patient undergoing acute hemodialysis.
4. Complications of plasmapheresis.
5. Types of AV fistula cannulation.
6. Define Hyponatremia and classify.
7. What are all the steps in dialyzer reprocessing?
8. Write about pre dialysis patient assessment.
9. What are all the possible contaminants in source water?
10. Causes of intra-dialytic hypertension.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123]

NOVEMBER 2023

Sub. Code: 1321

B.Sc. DIALYSIS TECHNOLOGY
THIRD YEAR (Regulation 2010-2011 onwards)
PAPER I – DIALYSIS TECHNOLOGY
Q.P. Code: 801321

Time: Three Hours

Answer ALL questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Explain in detail about Non-infectious complications of CAPD.
2. What are the psychosocial problems faced by dialysis patients? Explain about the need for counselling in ESRD patients.
3. Enumerate the principle of hemodialysis and peritoneal dialysis.

II. Write notes on:

(8 x 5 = 40)

1. If a patient comes in unconscious state to dialysis unit, what are the vital things to be checked? Give the normal and abnormal values of vitals to be measured.
2. Etiology of Intradialysis hypotension and hypertension and how will you manage it?
3. What is Kt/V binding? How to measure it?
4. Factors to be considered before blood transfusion and complications of blood transfusion.
5. What is Automated Peritoneal Dialysis and indications of APD over CAPD?
6. What is CRRT? Explain its uses.
7. Types of vascular access for Hemodialysis.
8. Exit Site infection in CAPD.

III. Short answers on:

(10 x 3 = 30)

1. Contraindications of Anticoagulant in dialysis patient.
2. How to manage cramps?
3. Dietary recommendations for patients in PD.
4. What are the indications for RRT?
5. Types of solution used in peritoneal dialysis.
6. What are the precautions to be taken to prevent seroconversion in hemodialysis unit?
7. Composition of dialysate.
8. Differentiate between CAPD and APD.
9. Define Plasmapheresis.
10. How to prevent peritonitis in peritoneal dialysis?
