

**MANIPAL UNIVERSITY**

**FRIST YEAR MASLP / MOT / MSc. MLT / MSc. RT / MSc. ECHOCARDIOGRAPHY / MSc. CARDIAC CATHETERIZATION & INTERVENTIONAL TECHNOLOGY / OPTOMETRY / MSc. MIT / MSc. RRT & DT / DEGREE EXAMINATION – JUNE 2016**

**SUBJECT: STATISTICS & RESEARCH METHODS / ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY / BIOSTATISTICS / ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY / PAPER IV: EPIDEMIOLOGY & BIOSTATISTICS / PAPER IV: EPIDEMIOLOGY & BIOSTATISTICS / PAPER IV: RESEARCH METHODOLOGY & BIOSTATISTICS / BIOSTATISTICS/ ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY**

Thursday, June 02, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

✍ **Answer ALL the questions.**

- 1A. Explain the situation for use and computation procedure of mean and median.  
1B. What is cluster sampling? Explain the procedure with example. List the advantages and disadvantages of this technique. (5+5 = 10 marks)
- 2A. Suppose the ages at time of onset of a certain disease are approximately normally distributed with a mean of 12 years and a standard deviation of 3 years. A child has just come down with the disease. What is the probability that the child is:  
i) Between the ages of 9 and 12 years?  
ii) Over 15 years?  
2B. Write a short note on Poisson distribution. (5+5 = 10 marks)
- 3A. Define the following terms:  
i) Power of a test  
ii) P-value  
iii) Type one and type two errors in testing of hypothesis  
3B. Describe with example the situation in which you would use independent sample t-test. What is the null hypothesis tested? List the assumptions. ((1+2+2)+5 = 10 marks)
- 4A. Differentiate parametric and non-parametric tests. Explain the situation for Kruskal-Wallis test.  
4B. Write a short note on the application of Chi-square test. (5+5 = 10 marks)
- 5A. A hospital administrator wishes to know what proportion of discharged patients is unhappy with the care received during hospitalization. How large a sample should be drawn if we let the error margin  $d = 0.1$ , the confidence coefficient is 0.95, and the anticipated percentage of unhappy patients is 30? (Given  $Z_{1-\alpha/2} = 1.96$ ).  
5B. Write a short note on Logistic Regression. (5+5 = 10 marks)

6. Discuss Cohort study under:

6A. Basic design

6B. Basic features

6C. Basic steps

6D. Merits and demerits

(10 marks)

7. Explain the structure of a scientific research paper.

(10 marks)

8. Write short notes on the following:

8A. Randomized controlled trials

8B. Sensitivity and specificity of a diagnostic test

(5+5 = 10 marks)



**MANIPAL UNIVERSITY****FIRST YEAR M.Sc. R.R.T. & D.T. DEGREE EXAMINATION – JUNE 2016****SUBJECT: MDT 601 – ANATOMY AND PHYSIOLOGY RELATED TO URINARY TRACT INCLUDING KIDNEY  
(TWO YEARS PROGRAMME 2014-15)**

Saturday, June 04, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

**1. Multiple choice questions – Select the single best answer:**

- 1A. Which gland is present on the upper pole of the kidney?
- Adrenal
  - Pituitary
  - Liver
  - Thymus
- 1B. Waste products of metabolism excreted by the kidneys include:
- Urea
  - Creatinine
  - Uric acid
  - All of the above
- 1C. The basic functional unit of kidney:
- Glomerulus
  - Tubule
  - Interstitium
  - Nephron
- 1D. The Juxtaglomerular apparatus is found in the:
- PCT
  - Loop of Henle
  - DCT
  - Collecting tubule
- 1E. Normal urine output per day is:
- 0.5L - 3L
  - 0.3L - 0.8L
  - 1L - 10L
  - 0.5L - 5L
- 1F. The kidneys receive \_\_\_\_\_ % of cardiac output:
- 30
  - 20
  - 15
  - 10
- 1G. Renal pyramids are present in:
- Renal cortex
  - Renal medulla
  - Renal pelvis
  - Urinary bladder

- 1H. Normal pH of blood is:
- i) 7.0 to 7.10
  - ii) 6.35 to 6.45
  - iii) 7.35 to 7.45
  - iv) 7.25 to 7.30
- 1I. GFR depends on:
- i) Glomerular permeability
  - ii) Hydraulic pressure
  - iii) Oncotic pressure
  - iv) All of the above
- 1J. Following are the risk factors for acute kidney injury EXCEPT:
- i) Severe dehydration
  - ii) Major burns
  - iii) Sepsis
  - iv) Fluid intake

(1 mark × 10 = 10 marks)

2. **Long essay questions:**

- 2A. Explain blood grouping and their significance during blood transfusion.
- 2B. Discuss development of kidney in embryo.

(10 marks × 2 = 20 marks)

3. **Short essay questions:**

- 3A. Define diffusion. Discuss factors affecting diffusion during dialysis.
- 3B. Illustrate renin angiotensin aldosterone system.
- 3C. Explain the tubular components of nephron.
- 3D. What is the normal pH of blood? Describe the role of kidney in pH homeostasis.
- 3E. Describe the distribution of water in the body compartments.
- 3F. Explain the anatomy of peritoneum.

(5 marks × 6 = 30 marks)

4. **Short note questions:**

- 4A. Write a note on renal pyramids.
- 4B. Define osmosis.
- 4C. Write the components of juxtaglomerular apparatus.
- 4D. Define estimated glomerular filtration rate. What is the normal estimated glomerular filtration rate in a healthy person?
- 4E. What are the major causes of anemia in chronic kidney disease?
- 4F. Write a note on mesonephros.
- 4G. Enumerate urine pathway.
- 4H. What are the normal levels of urea and creatinine?
- 4I. What is hemostasis?
- 4J. Write a note on endocrine functions of the kidney.

(2 marks × 10 = 20 marks)





## MANIPAL UNIVERSITY

FIRST YEAR M.Sc. R.R.T. & D.T. DEGREE EXAMINATION – JUNE 2016

SUBJECT: MDT 602 – PATHOLOGY, MICROBIOLOGY & PHARMACOLOGY  
RELATED TO KIDNEY AND DIALYSIS  
(TWO YEARS PROGRAMME 2014-15)

Tuesday, June 07, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

1. **Multiple choice questions – select the single best answer:**

- 1A. Kidney failure is usually detected by raise in blood \_\_\_\_\_ level
- i) Sodium
  - ii) Albumin
  - iii) Creatinine
  - iv) Glucose
- 1B. All these are pre renal cause of acute kidney injury EXCEPT
- i) Sepsis
  - ii) Severe burns
  - iii) Bladder cancer
  - iv) Heart failure
- 1C. Nephrotic syndrome is characterized by
- i) Hypoalbuminemia
  - ii) Edema
  - iii) i) & ii) both
  - iv) Neither i) nor ii)
- 1D. Agents that damage the kidney tissue are called as
- i) Nephrons
  - ii) Antibodies
  - iii) Nephrotoxins
  - iv) Endotoxins
- 1E. In chronic kidney disease anemia is
- i) Normocytic normochromic
  - ii) Microcytic normochromic
  - iii) Macrocytic normochromic
  - iv) None of the above
- 1F. Waste products of metabolism excreted by the kidneys include
- i) Urea
  - ii) Creatinine
  - iii) Uric acid
  - iv) All of the above
- 1G. The normal osmolarity of plasma is
- i) 290mOsmols/Kg
  - ii) 250mOsmols/Kg
  - iii) 345mOsmols/Kg
  - iv) 485mOsmols/Kg

- 1H. Amount of  $H^+$  produced daily is
- i) 1 meq/Kg
  - ii) 2 meq/Kg
  - iii) 3 meq/Kg
  - iv) 4 meq/Kg
- 1I. Urinary casts are formed in
- i) Proximal convoluted tubule
  - ii) Distal convoluted tubule
  - iii) Ureter
  - iv) Glomerulus
- 1J. The substance which accepts  $H^+$  ions is
- i) Base
  - ii) Acid
  - iii) Neutral
  - iv) None of the above

(1 mark  $\times$  10 = 10 marks)

2. **Long essay questions:**

- 2A. Discuss different types of diuretics used for chronic kidney disease patients.
- 2B. Explain anemia and its management in end stage kidney disease.

(10 marks  $\times$  2 = 20 marks)

3. **Short essay questions:**

- 3A. Write a note on imaging techniques used for renal analysis.
- 3B. Explain the causes of acute kidney injury.
- 3C. How to avoid seroconversion in hemodialysis unit?
- 3D. Discuss peritoneal dialysis fluid.
- 3E. Briefly explain phosphate binders.
- 3F. Describe the parathyroid hormone abnormality on chronic kidney disease.

(5 marks  $\times$  6 = 30 marks)

4. **Short note questions:**

- 4A. What is heparin induced thrombocytopenia?
- 4B. Write a note on antidote for heparin.
- 4C. What are the disadvantages of formaldehyde as a disinfectant?
- 4D. List the treatment options available for hyperkalemia.
- 4E. How hypocalcemia of chronic kidney disease is treated?
- 4F. What is hemadsorption?
- 4G. Write the disorders of fluid balance.
- 4H. List the side effects of erythropoietin therapy.
- 4I. Define chronic kidney disease.
- 4J. Define creatinine clearance.

(2 marks  $\times$  10 = 20 marks)



## MANIPAL UNIVERSITY

**FIRST YEAR M.Sc. (RRT & DT) DEGREE EXAMINATION – JUNE 2016**  
**SUBJECT: MDT 605 – BASIC PRINCIPLES AND OVERVIEW OF TYPES OF RENAL REPLACEMENT THERAPY (HD & PD) & THEIR APPLICATION TO PATIENT CARE**  
**(TWO YEARS PROGRAMME – 2014-15 BATCH)**

Thursday, June 09, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

**I. Multiple choice questions- Select the single best answer:**

- 1A. Heparin effect during HD monitored by
- Prothrombin time
  - Thrombin time
  - Bleeding time
  - Activated partial thromboplastin time
- 1B. \_\_\_\_\_ has no cardiopulmonary recirculation
- Arteriovenous graft
  - Arteriovenous fistula
  - Arteriovenous shunt
  - Central venous catheters
- 1C. The osmolarity of the 4.25% CAPD bag is approximately
- 400 mosm/L
  - 300-310 mosm/L
  - 345 mosm/L
  - 485 mosm/L
- 1D. Complications of chronic kidney disease include all except
- Hyperkalemia
  - Hyperphosphatemia
  - Hypocalcemia
  - Hypokalemia
- 1E. One of the following is complication of hemadsorption
- Hypocalcemia
  - Hypertension
  - Hemolysis
  - Thrombocytopenia
- 1F. Hemofilter clotting is more with \_\_\_\_\_ replacement
- Predilution
  - Postdilution
  - None of the above
  - Both i) & ii)
- 1G. Hemodialysis may be used in overdose of all the following EXCEPT
- Theophylline
  - Lithium
  - Aspirin
  - Amlodipine

- 1H. Diffusion depends on
  - i) Molecular weight
  - ii) Concentration gradient
  - iii) Membrane resistance
  - iv) All of the above
- 1I. Obesity is a BMI of
  - i) >22
  - ii) >24
  - iii) >28
  - iv) >36
- 1J. One of the following is true about continuous arteriovenous hemodialysis
  - i) Blood flow is kept at 250ml min
  - ii) Solute and fluid removal is variable
  - iii) Does not require heparinization
  - iv) Most useful continuous renal replacement therapy modality in hypotensive patients

(1 mark × 10 = 10 marks)

2. **Long essay question:**

- 2A. How nutritional assessment done in Chronic kidney diseases?
- 2B. Discuss vascular access complications.

(10 marks × 2 = 20 marks)

3. **Short essay questions:**

- 3A. Discuss heparin free dialysis.
- 3B. Discuss the advantages & disadvantages of arterio venous graft.
- 3C. Explain dialysis water pretreatment plant.
- 3D. Describe the basic requirements for dialyzer reuse area.
- 3E. Discuss peritoneal dialysis solution.
- 3F. What is isolated ultrafiltration explain with schematic diagram and when it is useful?

(5 marks × 6 = 30 marks)

4. **Short note questions:**

- 4A. What is low potassium diet?
- 4B. What is high flux dialysis?
- 4C. What are the contraindications for peritoneal dialysis in end stage kidney disease?
- 4D. What are the causes of anemia in chronic kidney disease?
- 4E. List the complications of erythropoietin therapy.
- 4F. Which toxins are removed by hemoperfusion?
- 4G. How is iron replaced in chronic kidney disease?
- 4H. What are the advantages of tunneled hemodialysis catheters?
- 4I. Write the steps of peritoneal dialysis.
- 4J. Which foods are rich in phosphorous?

(2 marks × 10 = 20 marks)





# MANIPAL UNIVERSITY

## FIRST YEAR M.Sc. (RRT & DT) DEGREE EXAMINATION – JUNE 2016

### SUBJECT: MDT 604 – RENAL TRANSPLANTATION (TWO YEARS PROGRAMME – 2014-15 BATCH)

Saturday, June 11, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

**Select the single best answer:**

- 1A. Which of the following is true in case of hyperacute rejection?
- It is mediated by preformed cytotoxic antibody
  - It occurs after many years of transplantation
  - Dialysis can reverse it
  - None of the above
- 1B. One of the following causes bonemarrow suppression
- Tacrolimus
  - Sirolimus
  - FK 506
  - Cyclosporin
- 1C. Origin and maturation of B cells takes place in the
- Liver
  - Thymus
  - Bone marrow
  - Lymph nodes
- 1D. Cyclosporine acts by
- Inhibition of B cells
  - Inhibition of T cells
  - Inhibition of immune system
  - Inhibition of major histocompatibility complex
- 1E. Cytomegalovirus(CMV) infection post renal transplant is rare in which combination of donor/recipient
- CMV+ / CMV+
  - CMV + / CMV-
  - CMV - / CMV+
  - CMV - / CMV -
- 1F. T lymphocytes mature in
- Thyroid
  - Thymus
  - Parathyroid
  - Kidney
- 1G. In following case, deceased donor kidney transplant cannot be performed EXCEPT
- Heart beating deceased donor, with elevated serum creatinine level
  - Non heart beating – brought dead, family is keen to donate organ to the needy
  - Heart beating deceased donor, normal RFT, family members not willing for donation
  - None of the above

- 1H. The genes for human leucocyte antigen proteins are clustered in the major histocompatibility complex located
- On the short arm of chromosome 6
  - On the long arm of chromosome 6
  - On the short arm of chromosome 10
  - On the long arm of chromosome 10
- 1I. Class I human leucocyte antigen is present in
- B cells
  - All nucleated cells
  - Antigen presenting cells
  - Red blood cells
- 1J. Graft survival is highest with
- Living related transplant
  - Donation after cardiac death transplant
  - Donation after brain death transplant
  - ABO incompatible transplant

(1 mark × 10 = 10 marks)

2. **Long essay questions:**

- 2A. Discuss steroids in kidney transplantation.  
2B. Explain types of immunity.

(10 marks × 2 = 20 marks)

3. **Short essay questions:**

- 3A. Describe T cells & their functions.  
3B. Discuss types of kidney rejection.  
3C. Describe the evaluation of the potential living kidney donor.  
3D. What are late complications of renal transplantation in a recipient?  
3E. Explain major histocompatibility cells.  
3F. Explain living donor kidney transplantation.

(5 marks × 6 = 30 marks)

4. **Short note questions:**

- 4A. What is paired donation?  
4B. Define brain stem death.  
4C. What are the purposes of kidney transplantation?  
4D. Write a note on phagocytosis.  
4E. Write a note on antithymoglobulins.  
4F. What is the importance of HLA typing in kidney transplantation?  
4G. What is virtual crossmatch?  
4H. Write the special features of acquired immunity.  
4I. Name any four transplantable tissues.  
4J. What is organ donation?

(2 marks × 10 = 20 marks)

