

MANIPAL UNIVERSITY

**FRIST YEAR MASLP / MOT / MSc. MLT / MSc. RT / MSc. ECHOCARDIOGRAPHY /
OPTOMETRY / MSc. MIT / MSc. RRT & DT DEGREE EXAMINATION – JUNE 2017**

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

Friday, June 02, 2017

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

1. Define the following:

- 1A. Any three measures of central tendency
- 1B. Qualitative and quantitative variables with examples
- 1C. Sampling errors and non-sampling errors
- 1D. Sampling frame, probability sampling and non-probability sampling

(3+2+2+3 = 10 marks)

- 2A. Write the properties of normal distribution. List any two applications of normal distribution.
- 2B. The mean rate of adenosine triphosphate among a sample of 30 insulin resistant children was found to be 6 $\mu\text{mol/g}$ of muscle/min with standard deviation of 2 $\mu\text{mol/g}$ of muscle/min. Find the 95% and 99% confidence intervals for the mean rate of adenosine triphosphate for the study population.

(5+5 = 10 marks)

- 3A. Define type I error, type II error, level of significance and power of a statistical test of significance.
- 3B. Hypothermia is a problem for extremely low birth weight infants. A study was conducted to investigate whether wrapping these infants in polyethylene bags in the delivery room and while they are being transferred to the neonatal intensive care unit affects the survival of babies. The results of the study conducted among 140 extreme low birth weight babies are given in the following table:

Warming treatment	Number of infants		Total
	Lived	dead	
Polyethylene bag	63	7	70
Traditional	61	9	70
Total	124	16	140

Test at 5% level of significance whether mortality among the extreme low birth weight infants is associated with the kind of warming treatment given. The table value for 5% level of significance is 3.84.

(4+6 = 10 marks)

4. Discuss independent sample t test and paired t test with an example.

(10 marks)

5. Explain case control study under the headings:

- i) design with the help of a flow chart
- ii) measure of strength of association
- iii) merits
- iv) demerits

(4+2+2+2 = 10 marks)

6A. Write a short note on randomization in clinical trials.

6B. A randomized controlled trial has been planned to compare the effects of low fat diet with the diet recommended by the American Diabetic Association. The outcome variable is the total cholesterol (in mg/dL). What is the minimum number of subjects required in each group to detect a difference in total cholesterol of 20 mg/dL between the two groups with 90% power and 5% level of significance? Based on the earlier experience the standard deviation of total cholesterol in the population is about 35 mg/dL. The table value for 90% power and 5% level of significance is 1.28 and 1.96 respectively.

(5+5 = 10 marks)

7. **Write short notes on:**

- 7A. Validity of diagnostic test
- 7B. Structure of research thesis
- 7C. Meta-analysis
- 7D. Logistic regression

(5 marks × 4 = 20 marks)



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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. R.R.T. & D.T. DEGREE EXAMINATION – JUNE 2017

SUBJECT: MDT 601 – ANATOMY AND PHYSIOLOGY RELATED TO URINARY TRACT INCLUDING KIDNEY
(TWO YEARS PROGRAMME 2014-15)

Monday, June 05, 2017

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

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

1A. Waste products of metabolism excreted by the kidneys include:

- i) Urea
- ii) Creatinine
- iii) Uric acid
- iv) All of the above

1B. Kidney mainly excretes:

- i) Products of carbohydrate metabolism
- ii) Products of fat metabolism
- iii) Nitrogenous waste products
- iv) Acidic products

1C. Normal urine output per day is:

- i) 0.5L – 3L
- ii) 0.3L- 0.8L
- iii) 1L- 10L
- iv) 0.5L- 5L

1D. Renal plasma flow is:

- i) 625ml/min
- ii) 1025ml/min
- iii) 2025 ml/min
- iv) 225 ml/min

1E. Water absorption in the collecting duct occurs due to action of:

- i) ADH
- ii) Renin
- iii) Erythropoietin
- iv) Angiotensin

1F. pH=

- i) $\log (H^+)$
- ii) $-\log(H^+)$
- iii) $1/\log(OH^+)$
- iv) $1/-\log(H^+)$

1G. Bicarbonate is mainly absorbed by:

- i) Loop of Henle
- ii) Distal convoluted tubule
- iii) Proximal convoluted tubule
- iv) None of the above

1H. The main process involved in renal excretion is:

- i) Filtration
- ii) Reabsorption
- iii) Secretion
- iv) All of the above

1I. Renin is secreted by:

- i) Adrenal gland
- ii) Pituitary gland
- iii) Thymus
- iv) Juxtaglomerular apparatus cells

1J. These are the components of blood EXCEPT:

- i) Red blood cells
- ii) Platelets
- iii) Intercalated cells
- iv) Leukocytes

(1 mark × 10 = 10 marks)

2. **Long essay:**

2A. Explain composition of blood with their functions.

2B. Discuss total body water. Write the functions of total body water.

(10 marks × 2 = 20 marks)

3. **Short essay questions.**

3A. Illustrate Vitamin D pathway.

3B. Explain anatomy of peritoneum.

3C. Write a note on creatinine.

3D. Describe vascular supply of the kidney.

3E. Describe glomerular filtration barrier.

3F. Write a note on solute transport mechanism in peritoneal dialysis.

(5 marks × 6 = 30 marks)

4. **Short note questions.**

4A. Define osmosis.

4B. Name the special cells of collecting duct.

4C. Which blood vessels are commonly used for creation of arteriovenous fistula?

4D. Define clearance.

4E. What is hemostasis?

4F. Name the parts of renal corpuscle.

4G. Define osmolality. What is the normal serum osmolality level?

4H. Name the two major organs involved in acid base regulation in human.

4I. What is macula densa?

4J. Write a note on pronephros.

(2 marks × 10 = 20 marks)



MANIPAL UNIVERSITY**FIRST YEAR M.Sc. R.R.T. & D.T. DEGREE EXAMINATION – JUNE 2017****SUBJECT: MDT 602 – PATHOLOGY, MICROBIOLOGY & PHARMACOLOGY
RELATED TO KIDNEY AND DIALYSIS
(TWO YEARS PROGRAMME 2014-15)**

Wednesday, June 07, 2017

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

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

1A. All of the following are causes of hypo-responsiveness to Epoetin EXCEPT:

- i) Severe hyperparathyroidism
- ii) Iron deficiency
- iii) Inadequate dialysis
- iv) Hypoparathyroidism

1B. Anuria > 12 hours stands for which stage of RIFLE?

- i) Risk
- ii) Injury
- iii) Failure
- iv) Loss

1C. Fluid of choice for fluid resuscitation in early acute kidney injury is:

- i) 0.9% Normal saline
- ii) Albumin
- iii) 0.45% saline
- iv) All of the above

1D. Contrast Nephropathy can be prevented by using:

- i) Normal saline
- ii) Bicarbonate solution
- iii) N Acetyl cysteine
- iv) All of the above

1E. Which of the following is not a prerenal cause of acute kidney injury:

- i) Congestive cardiac failure
- ii) Cirrhosis of liver
- iii) Acute diarrhea
- iv) Acute Glomerulonephritis

1F. Continuous ambulatory peritoneal dialysis is contraindicated in:

- i) Previous abdominal surgeries
- ii) Blindness
- iii) Presence of hernias
- iv) All of the above

1G. One of the indications for Vitamin D supplementation in chronic kidney disease is:

- i) Hyperphosphatemia
- ii) Hypercalcemia
- iii) Hypocalcemia
- iv) Hyperkalemia

1H. The preferred site for long term hemodialysis catheter access is:

- i) Femoral vein
- ii) Subclavian vein
- iii) Right External jugular vein
- iv) Internal Jugular vein

1I. The ideal arteriovenous fistula needling technique is:

- i) Button holing
- ii) Step ladder
- iii) Area
- iv) None of the above

1J. The definitive test to diagnose arteriovenous fistula stenosis is:

- i) Doppler ultrasound
- ii) Pulse augmentation test
- iii) Dynamic pressure monitoring
- iv) Fistulogram

(1 mark × 10 = 10 marks)

2. **Long essay questions:**

2A. Compare and contrast arteriovenous fistula with synthetic arteriovenous graft as access for Hemodialysis. Why should permanent vascular access be established well in time for initiation of hemodialysis?

2B. Discuss the complications of acute kidney injury.

(10 marks × 2 = 20 marks)

3. **Short essay questions:**

3A. Discuss the contraindications and limitations of peritoneal dialysis in chronic kidney disease.

3B. Discuss the cardiovascular complications of chronic kidney disease.

3C. Discuss the methods of anticoagulation used in hemodialysis therapy.

3D. Describe the etiopathogenesis of mineral and bone disorders of chronic kidney disease.

3E. How anemia in chronic kidney disease investigated and what are the treatment options?

3F. What are the risk factors for sepsis in chronic kidney disease? Discuss briefly the means of prevention of sepsis in the hemodialysis unit.

(5 marks × 6 = 30 marks)

4. **Short notes questions:**

4A. Classify diuretics.

4B. Name the complications of erythropoietin stimulating agent therapy.

4C. What are the causes of proteinuria?

4D. How can fluid removal be regulated in the continuous ambulatory peritoneal dialysis patient?

4E. What is Kt/V?

4F. Name four causes of acute kidney injury.

4G. How is suspected hepatitis B investigated in the hemodialysis patient?

4H. How is hypocalcemia of chronic kidney disease treated?

4I. List the hematological complications of chronic kidney disease.

4J. How can recirculation in the arteriovenous fistula be prevented?

(2 marks × 10 = 20 marks)



MANIPAL UNIVERSITY**FIRST YEAR M.Sc. (RRT & DT) DEGREE EXAMINATION – JUNE 2017**
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)

Friday, June 09, 2017

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

1. Multiple choice questions- Select the single best answer:

1A. More ultrafiltration in continuous ambulatory peritoneal dialysis is achieved by:

- i) 1.5%
- ii) 2.5%
- iii) 4.25%
- iv) 1%

1B. One of the following is not a complication of AV Fistula:

- i) Thrombosis
- ii) Steal phenomenon
- iii) Hemorrhage
- iv) Hemolysis

1C. A patient with stable eGFR of around 55ml/min has:

- i) CKD stage 2
- ii) CKD stage 3
- iii) Not got CKD if the urinalysis is normal
- iv) CKD stage 4

1D. Indications for dialysis include all of the following EXCEPT:

- i) Metabolic acidosis
- ii) Severe hyperkalemia
- iii) Pulmonary edema
- iv) Hypokalemia

1E. Complications of peritoneal dialysis include:

- i) Fluid overload
- ii) Protein loss
- iii) Hyperglycemia
- iv) All of the above

1F. Anemia of iron deficiency on a peripheral smear appears as:

- i) Normocytic normochromic
- ii) Microcytic Hypochromic
- iii) Macrocytic
- iv) Polychromatic

1G. Buffer used in peritoneal dialysis fluid is:

- i) Dextrose
- ii) Icodextrin
- iii) Lactate
- iv) Sodium

- 1H. All of the following are causes of hypo- responsiveness to Epoietin EXCEPT:
- i) Severe hyperparathyroidism
 - ii) Iron deficiency
 - iii) Inadequate dialysis
 - iv) Hypoparathyroidism
- 1I. Which of the following is not a rich source of calcium?
- i) Eggs
 - ii) Ragi
 - iii) Fish
 - iv) Fruits and vegetables
- 1J. Peritoneal dialysis patients have a _____ protein requirement than transplant recipients.
- i) Higher
 - ii) Lower
 - iii) Same
 - iv) Any of the above

(1 marks × 10 = 10 marks)

2. **Long essay questions:**

- 2A. Discuss hemodialyzers.
2B. Discuss peritoneal dialysis fluid.

(10 marks × 2 = 20 marks)

3. **Short essay questions:**

- 3A. Describe the principles of dietary therapy for the maintenance hemodialysis patients.
3B. Which are the renal replacement therapy options in acute kidney injury?
3C. Discuss CRBSI in hemodialysis.
3D. Discuss handling of first arteriovenous fistula cannulation.
3E. Explain SPAD.
3F. Write a note on PET test.

(5 marks × 6 = 30 marks)

4. **Short note questions:**

- 4A. What are the disadvantages of ultra violet treatment of water for dialysis?
4B. How can recirculation in the arteriovenous fistula be prevented?
4C. List the complications of hyperphosphatemia.
4D. Why is calcium supplementation necessary in chronic kidney disease?
4E. What is low potassium diet?
4F. What is SCUF?
4G. What is hemadsorption?
4H. List the benefits of fresh frozen plasma over albumin.
4I. What is dialysis disequilibrium syndrome?
4J. Why peritoneal dialysis is recommended for children below 10kgs?

(2 marks × 10 = 20 marks)



MANIPAL UNIVERSITY**FIRST YEAR M.Sc. (RRT & DT) DEGREE EXAMINATION – JUNE 2017****SUBJECT: MDT 604 – RENAL TRANSPLANTATION
(TWO YEARS PROGRAMME – 2014-15 BATCH)**

Monday, June 12, 2017

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

☞ Select the single best answer:

1. One of the following is not used for induction:
 - i) Sirolimus
 - ii) Anti-thymocyte globulin
 - iii) Basiliximab
 - iv) Alemtuzumab
2. Humoral Immunity is mediated by:
 - i) B cells
 - ii) T cells
 - iii) Both i) and ii)
 - iv) Plasma cells
3. Origin and maturation of B cells takes place in the:
 - i) Liver
 - ii) Thymus
 - iii) Bone marrow
 - iv) Lymph nodes
4. Sensitization is caused by:
 - i) Blood transfusion
 - ii) Child birth
 - iii) Renal transplantation
 - iv) All of the above
5. One of the following is not a side effect of Mycophenolate:
 - i) Vomiting
 - ii) Diarrhoea
 - iii) Leukopenia
 - iv) Hypertension
6. T cell mediates:
 - i) Humoral immunity
 - ii) Non-specific defense
 - iii) Cell mediated immunity
 - iv) None of these
7. All of the drugs are used in immunosuppression in transplantation EXCEPT:
 - i) Tacrolimus
 - ii) Mycophenolate
 - iii) Steroids
 - iv) Cyclophosphamide

8. One of the following is not a side effect of steroids:

- i) Hypertension
- ii) Hyperglycemia
- iii) Osteoporosis
- iv) Prostatic hypertrophy

9. Decoy cells are characteristically seen in:

- i) Polyoma virus nephropathy
- ii) Cytomegalovirus disease
- iii) Epstein Barr virus disease
- iv) Tuberculosis

10. Cyclosporine acts by:

- i) Inhibition of B cells
- ii) Inhibition of T cells
- iii) Inhibition of immune system
- iv) Inhibition of major histocompatibility complex

(1 mark × 10 = 10 marks)

2. **Long essay questions:**

2A. Describe the workup for a potential renal donor.

2B. What are the long term sequelae of renal transplantation?

(10 marks × 2 = 20 marks)

3. **Short essay questions:**

3A. What is acute rejection?

3B. Describe the Calcineurin inhibitors used in renal transplantation.

3C. What is the role of steroids in renal transplantation?

3D. What are the causes of acute allograft dysfunction?

3E. Discuss immunity.

3F. Discuss the non-immunosuppressant medications used post transplantation.

(5 marks × 6 = 30 marks)

4. **Short notes question:**

4A. Which are the human leucocyte antigen relevant to renal transplantation?

4B. How can sensitization be managed?

4C. What is chronic allograft nephropathy?

4D. List the side effects of steroids.

4E. What are the side effects of mycophenolatemofetil?

4F. Name the agents used for induction immunosuppression.

4G. What is virtual crossmatch?

4H. What are the absolute contraindications for renal transplantation in the potential recipient?

4I. What is tolerance?

4J. Who is an altruistic donor?

(2 marks × 10 = 20 marks)

