MANIPAL UNIVERSITY

FIRST YEAR MOT/M.Sc. (RRT & DT)/ M.Sc. RT/ M.A.S.L.P/M.Sc. MLT/M.Sc. MIT/ M.Sc. ECHOCARDIOGRAPHY/M. OPT DEGREE EXAMINATION – JUNE 2015

SUBJECT: ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY/ STATISTICS & RESEARCH METHODS/BIOSTATISTICS/EPIDEMIOLOGY & BIOSTATISTICS / RESEARCH METHODOLOGY & BIOSTATISTICS

Tuesday, June 02, 2015

Time: 10:00 – 13:00 Hrs.   Max. Marks: 80

✍   **Answer ALL the questions.**

1A. With the help of suitable examples discuss the quantitative and qualitative variables.

1B. Explain systematic random sampling with an example. What are the advantages and disadvantages of this method?

(5+5 = 10 marks)

2A. Discuss skewness and kurtosis.

2B. A sample of 50 liver cirrhosis subjects were selected and the mean serum potassium level was observed to be 5.4 mEq/L with standard deviation of 2.5 mEq/L. Find the 95% and 99% confidence intervals for mean serum potassium level among liver cirrhosis subjects. (The standard normal table values for 95% and 99% confidence levels are 1.96 and 2.58 respectively).

(5+5 = 10 marks)

3A. Enumerate the steps in hypothesis testing.

3B. What do you mean by non-parametric tests? With suitable examples briefly explain the applications of Mann Whitney U test and Wilcoxon signed rank test.

(5+5 = 10 marks)

4. The mean serum cholesterol level of 25 randomly selected normal healthy men is 240 mg/dl with a standard deviation of 40 mg/dl. The mean serum cholesterol level of 20 randomly selected men who undergone coronary bypass surgery during the preceding two year period is 260 mg/dl with standard deviation of 56 mg/dl.

4A. Name the statistical test used for comparing the mean serum cholesterol levels between the two groups.

4B. Write the null hypothesis and alternate hypothesis for this test.

4C. What are the assumptions for this test?

4D. Compute the value of test statistic for the above study.

4E. Briefly explain how do you take a decision on acceptance and rejection of null hypothesis for the above study.

(1+1+2+4+2 = 10 marks)

5A. Explain how do you compute sample size for comparing means of two independent groups.

5B. A research team conducted a case-control study examining the relationship between daily alcohol consumption and liver cancer. The team selected 2000 cases and 2000 controls and observed that 700 cases and 400 controls daily take alcohol. Make a two by two table and find the appropriate measure of strength of association between alcohol consumption and liver cancer. How do you interpret it?

(5+5 = 10 marks)

6. What do you mean by randomization in RCTs? Explain the simple, block and stratified randomization methods.

(1+9 = 10 marks)

7. Explain the structure of research thesis.

(10 marks)

8. **Write short notes on:**

8A. Survival analysis

8B. Validity and reliability of diagnostic tools

(5+5 = 10 marks)

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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: IMMUNOLOGY AND IMMUNOLOGICAL TECHNIQUES

Thursday, June 04, 2015

Time: 10:00 – 13:00 Hrs.   Maximum Marks: 70

✍   **Answer ALL the questions.**

✍   **Draw diagrams if necessary.**

1A. Describe the maturation, activation and differentiation of B cells.

1B. Define Monoclonal Antibodies. Describe Hybridoma technique. Add a note on clinical applications of monoclonal Antibodies.

1C. Enumerate and describe the neutrophil function tests.

(10 marks × 3 = 30 marks)

2.   **Write briefly on:**

2A. Cell mediated immune response

2B. Properties and functions of cytokines

2C. FACS

2D. Mechanism of innate immunity

2E. Thymus

(5 marks × 5 = 25 marks)

3.   **Write short notes on:**

3A. MALT

3B. Adjuvants

3C. Hemagglutination inhibition tests

3D. NK cells

3E. ADCC

(3 marks × 5 = 15 marks)

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: MOLECULAR BIOLOGY AND APPLIED GENETICS

Saturday, June 06, 2015

Time: 10:00 – 13:00 Hrs.   Maximum Marks: 70

✍ **Answer ALL questions.**

✍ **Draw diagrams wherever necessary.**

1A. Define cell cycle. Discuss the regulation of cell cycle events.

1B. Describe the process of transcription in eukaryotes.

1C. Discuss the steps in recombinant DNA technology. Add a note on restriction endonuleases.

(10 marks × 3 = 30 marks)

2.   **Write detailed notes on:**

2A. Prenatal diagnosis of genetic diseases

2B. Human genome project

2C. Polymerase chain reaction

2D. Types of mutations

2E. DNA repair

(5 marks × 5 = 25 marks)

3.   **Write brief notes on:**

3A. Satellite DNA

3B. tRNA

3C. Transgenic organisms

3D. Ames test

3E. Cystic fibrosis

(3 marks × 5 = 15 marks)

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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: CLINICAL PATHOLOGY AND HAEMATOLOGY

Tuesday, June 09, 2015

Time: 10:00 – 13:00 Hrs.   Maximum Marks: 70

✍   **Answer ALL questions.**

✍   **Draw diagrams wherever necessary.**

1A.   Classify anemia based morphology. Discuss symptoms and lab diagnosis of Peroxismal Nocturnal Haemoglobinuria (PNH).

1B.   Define and classify leukemia. Discuss chronic lymphocytic leukemia and prolymphocytic leukemia.

1C.   Give an account of physical examination done on urine with its clinical significance.

(10 marks × 3 = 30 marks)

2.   **Write detailed notes on:**

2A.   Bone marrow aspiration

2B.   Tests to detect vit B12 deficiency

2C.   Etiology and symptoms of iron deficiency anemia

2D.   Morphology of spermatozoa

2E.   Platelet function test

(5 marks × 5 = 25 marks)

3.   **Write short notes on**

3A.   Test to detect bile pigment in urine

3B.   Megakaryopoisis

3C.   RBC inclusion bodies

3D.   Molecular defects in sickle cell anemia

3E.   Ringed sideroblasts

(3 marks × 5 = 15 marks)

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: IMMUNOPATHOLOGY

Thursday, June 11, 2015

Time: 10:00 – 13:00 Hrs.   Maximum Marks: 80

✍   **Answer ALL the questions.**

✍   **Draw Diagrams if necessary.**

1A.   Discuss complement abnormalities.

1B.   What is transplantation? Discuss heart transplantation.

1C.   Explain Rheumatoid arthritis.

(10 marks × 3 = 30 marks)

2.   **Write notes on:**

2A.   Cold antibody diseases

2B.   Delayed hypersensitivity reactions

2C.   Bullous pemphigoid

2D.   Infertility

2E.   Glomerulonephritis

2F.   Transfusion reactions

2G.   Multiple sclerosis

(5 marks × 7 = 35 marks)

3.   **Write short notes on:**

3A.   Leprosy

3B.   Food hypersensitivity reactions

3C.   Hemophilia

3D.   Tumor markers

3E.   SCID

(3 marks × 5 = 15 marks)

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: CLINICAL BIOCHEMISTRY
(SPECIALIZATION: MICROBIOLOGY)

Saturday, June 13, 2015

Time: 10:00 – 13:00 Hrs.

Maximum Marks: 70

✍ Answer ALL questions.

✍ Draw diagrams wherever necessary.

1A. What are the functions of kidney. Discuss the tests for role of kidney in filtration.

1B. Define and classify jaundice. Explain the differential diagnosis of jaundice.

1C. Define and classify enzymes. Discuss the various diagnostic enzymes used in clinical medicine.

(10 marks × 3 = 30 marks)

2. Write detailed notes on:

2A. Mechanism of action of epinephrine

2B. Metabolic changes and associated complications in diabetics

2C. Internal quality control procedures for preanalytical variables

2D. Analysis of urine for protein and sugar

2E. Serum lipid profile with clinical correlation

(5 marks × 5 = 25 marks)

3. Write brief notes on:

3A. Continuous flow analyzers

3B. Calibration of volumetric flask by gravimetric method

3C. Material Safety Data Sheet

3D. Disposal of chemical waste

3E. NBT-PABA test for pancreatic function

(3 marks × 5 = 15 marks)

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: GENERAL MICROBIOLOGY
(SPECIALIZATION: BIOCHEMISTRY)

Saturday, June 13, 2015

Time: 10:00 – 13:00 Hrs.   Maximum Marks: 70

✍ **Answer ALL questions.**

✍ **Draw diagrams wherever necessary.**

1A. Enumerate different molecular techniques for identification of bacteria. Discuss polymerised chain reaction.

1B. Discuss components external to the cell wall. Add a note on ultra structure of bacterial flagella.

1C. Define and classify sterilisation. Discuss sterilisation by moist heat.

(10 marks × 3 = 30 marks)

2.   **Write detailed notes on:**

2A. Electron microscope

2B. Beta lactamase drugs

2C. Bacterial Conjugation

2D. Bacterial growth curve

2E. Cell wall

(5 marks × 5 = 25 marks)

3.   **Write short notes on:**

3A. RCM

3B. Cytoplasmic matrix

3C. Enriched media

3D. Facilitated diffusion

3E. Chemical sterilisation

(3 marks × 5 = 15 marks)

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2015

SUBJECT: BIOMEDICAL TECHNIQUES

Monday, June 15, 2015

Time: 10:00 – 11: 30 Hrs.   Maximum Marks: 40

✍   **Answer ALL questions.**

✍   **Draw diagrams wherever necessary.**

1.   Define Beer-Lambert law. Discuss about components and working of spectrophotometer.

(3+7+5 = 15 marks)

2.   **Write detailed notes on:**

2A.   High energy compounds

2B.   Flame photometer

2C.   Scintillation counter

2D.   Supporting media used in zone electrophoresis

2E.   Working of pH meter

(5 marks × 5 = 25 marks)