Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: BIOSTATISTICS

Tuesday, May 28, 2013

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

✍ **Answer all questions.**

1. Define the following:

1A. Alternate hypothesis

1B. Type II error

1C. P- value

1D. Level of significance

1E. Parameter

(1×5 = 5 marks)

2A. Define various measures of central tendency and write the situations where each one is appropriate.

2B. Explain the method of systematic sampling and state its merits and demerits.

(5+5 = 10 marks)

3A. A researcher identified coronary risk factors among men and women in a long term health care facility. Of the 250 male subjects, 62 had hypertension. Of the 1100 female subjects, 265 had hypertension. Construct 95% confidence interval for difference in proportions of hypertension between male and females and interpret it.

3B. A sample of 500 students participated in a study to evaluate the level of their knowledge of risk factors for a certain group of diseases and the result is given below:

Course	**Knowledge of risk factors**		
	Good	**Poor**	**Total**
Paramedical	72	50	122
Engineering	58	320	378
Total	130	370	500

Do these data suggest that there is an association between knowledge of risk factors for the group of disease and major field of study from which the present sample is drawn? (Let α=0.05, Chi square for 1 degree of freedom= 3.84).

(5+5 = 10 marks)

4A. Explain the design, conduct and analysis of cohort study.

4B. A group of 5000 men with the habit of chewing tobacco and another group of 8000 men without the habit were followed up for a specified length of time, to assess the association between tobacco chewing and oral cancer. At the end of follow up 45 cases were observed among the chewing group and 22 cases among non-chewers group. Construct a 2×2 table for this information. Obtain the strength of association between tobacco chewing habits and oral cancer. Interpret the findings.

(10+5 = 15 marks)

5A. Discuss about materials and methods in a research report.

5B. Briefly explain the multivariate technique used for the analysis of time-to event data.

(5+5 = 10 marks)

6. Write short notes on:

6A. Sample size determination for estimation of mean

6B. Wilcoxon signed rank test

6C. Analysis of Variance

6D. Regression

6E. Systematic reviews

6F. Binomial distribution

(5×6 = 30 marks)

Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: MOLECULAR BIOLOGY AND APPLIED GENETICS

Saturday, June 01, 2013

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

- **Answer all questions.**
- **Draw diagrams wherever necessary.**

1A. Explain the process of translation of mRNA in detail.

1B. Enumerate the various cytogenetic techniques used for chromosome analysis. Explain chromosome banding.

1C. What is mutation? Discuss about induced and spontaneous mutations.

(10×3 = 30 marks)

2. Write short notes on:

2A. Plasmids

2B. Recombinant vaccines

2C. Genetics of cancer

2D. Human Genome Project

2E. Polymerase chain reaction

(5×5 = 25 marks)

3. Write brief notes on:

3A. Down's syndrome

3B. DNA finger printing

3C. DNA ligase

3D. Lac operon

3E. Cell cycle check points

(3×5 = 15 marks)

Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: CLINICAL PATHOLOGY AND HAEMATOLOGY

Tuesday, June 04, 2013

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

- **Answer all Questions.**
- **Draw diagrams wherever necessary.**

1A. Define and classify leukemia. Discuss acute myeloid leukemia.

1B. Discuss microscopic appearance of CSF. Tabulate the difference between traumatic tap and subarachnoid hemorrhage.

1C. Define haemostasis. Elaborate on steps involved in the normal haemostasis mechanism.

(10×3 = 30 marks)

2. Write detailed notes on:

2A. Iron deficiency anaemia

2B. Multiple myeloma

2C. Microscopic examination of semen

2D. Sickle cell anaemia

2E. Urine microscopy

(5×5 = 25 marks)

3. Write short notes on:

3A. Megakaryopoiesis

3B. Schilling test

3C. Sideroblasts

3D. Romanowsky stain

3E. Pappenheimer bodies

(3×5 = 15 marks)

Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: IMMUNOPATHOLOGY

Thursday, June 06, 2013

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

- **Answer All questions.**
- **Draw diagrams if necessary.**

1. Answer the following:

1A. Define Transplantation. Elaborate about kidney transplantation.

1B. Describe Phagocytic defects.

1C. Discuss on Granulomatous reactions.

(10×3 = 30 marks)

2. Write detailed notes on:

2A. Pernicious anaemia

2B. SLE

2C. Erythroblastosis foetalis

2D. Arthus reaction

2E. Cold antibody diseases

2F. Polyarteritis nodosa

2G. Serum sickness

(5×7 = 35 marks)

3. Write short notes on:

3A. Atopic allergy

3B. Hemophilia

3C. Encephalomyelitis

3D. Cancer chemotherapeutics

3E. Grave's disease

(3×5 = 15 marks)

Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: CLINICAL BIOCHEMISTRY
(SPECIALIZATION: MICROBIOLOGY)

Saturday, June 08, 2013

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

- **Answer all questions.**
- **Draw diagrams wherever necessary.**

1. Answer the following:

1A. Define and classify jaundice. Explain the various tests for liver function based on its role in bilirubin metabolism.

1B. What are the various types of automated analyzers? Explain the discrete analyzers.

1C. What are the functions of kidney? Discuss about the glomerular function and diagnosis of its dysfunction.

(10×3 = 30 marks)

2. Write short notes on:

2A. Internal quality control procedures.

2B. Regulation of blood glucose.

2C. Lipoproteins.

2D. Chemical hazards and their safety precautions.

2E. Significance of isoenzymes.

(5×5 = 25 marks)

3. Write brief notes on:

3A. Mechanism of action of thyroxin.

3B. Calibration of volumetric flask by gravimetric method.

3C. Non-invasive tests for pancreatic function.

3D. Disposal of infectious waste.

3E. Thyroid autoantibodies.

(3×5 = 15 marks)

Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: GENERAL MICROBIOLOGY
(SPECIALIZATION: BIOCHEMISTRY)

Saturday, June 08, 2013

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

- **Answer all Questions.**
- **Draw diagrams wherever necessary.**

1. Answer the following:

1A. Discuss genetic engineering. Add a note on its applications.

1B. Explain the different methods of antibiotic susceptibility testing.

1C. Discuss open and closed culture system with its uses. Add a note on chemostat and turbidistat.

(10×3 = 30 marks)

2. Write detailed notes on:

2A. Antiviral agents

2B. Anerobic culture methods

2C. Bacterial conjugation

2D. Dry heat sterilization

2E. Flagella

(5×5 = 25 marks)

3. Write short notes on:

3A. Sterilisation by chemical methods

3B. Differential media

3C. RCM

3D. Tyndallisation

3E. Freeze etching

(3×5 = 15 marks)

Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: BIOMEDICAL TECHNIQUES

Tuesday, June 11, 2013

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

✍ **Answer all questions. Draw diagrams if necessary.**

1. Discuss about principle, procedure and applications of gel electrophoresis

(3+8+4 = 15 marks)

2. Write notes on:

2A. Ion selective electrodes.

2B. Thin layer chromatography.

2C. Electron transport chain.

2D. Geiger counter.

2E. HPLC.

(5×5 = 25 marks)

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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: IMMUNOLOGY AND IMMUNOLOGICAL TECHNIQUES

Thursday, May 30, 2013

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

Answer all the questions. Draw Diagrams if necessary.

1A. Define Inflammation. Describe the mediators and mechanisms of inflammation.

1B. What is Antigen Processing? Describe the pathways of Antigen Processing.

1C. Explain about Histocompatibility testing.

(10×3 = 30 marks)

2. Write detailed notes on:

2A. MHC genes

2B. Thymus

2C. T Cell Receptor

2D. Vaccines

2E. ELISA

(5×5 = 25 marks)

3. Write short notes on:

3A. Macrophage.

3B. Double diffusion.

3C. Mixed Lymhocyte Culture.

3D. Phagocytosis.

3E. Haemolytic assay of Complement.

(3×5 = 15 marks)

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MANIPAL UNIVERSITY

FIRST YEAR MASLP (NR)/M.Sc. MLT/M.Sc. MIT/M.Sc. NMT/M.Sc. ECHOCARDIOGRAPHY DEGREE EXAMINATION – DECEMBER 2013

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

Wednesday, December 18, 2013

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

1. Define Biostatistics and enumerate its applications in Para-medical research.

(5 marks)

2. What are different methods of drawing a simple random sample? Explain any.

(2+3 = 5 marks)

3. Define and explain the interrelations among the concepts of sampling distribution, standard error and confidence interval with an example.

(10 marks)

4. **Distinguish between**

4A. Parametric and non-parametric tests

4B. Null and alternate hypothesis

4C. Two sided and one sided test

4D. Type I and type II error

4E. Level of significance and p-value

(2×5 = 10 marks)

5. Prior to the time that germ theory of disease was established, the mortality rate from surgery was very high due to infection. Joseph Lister sprayed the air with carbolic acid and used it in patients dressing. Lister compared 80 operations in which this procedure was used with 70 others where it was not used. The results are given in the following table.

	Patient lived	**Patient died**	**Total**
Carbolic acid used	68	12	80
Carbolic acid not used	38	32	70
Total	106	44	150

At 5% level of significance, test whether the outcome of the surgery is independent of the use of carbolic acid or not. ($\chi^2_{1df}(0.05) = 3.84$)

(10 marks)

6. Explain with distinction positive and negative correlation and list the properties of Pearson's correlation coefficient.

(5 marks)

7. Discuss case-control and cohort study designs and enumerate their relative merits and demerits.

(10 marks)

8. A cohort study was conducted to find the effect of oral contraceptive (OC) use on breast cancer. Ten thousand women free from breast cancer were selected for the study and followed up for 10 years. Forty out of 8000 non users of OC and 14 out of 2000 OC users developed breast cancer. Calculate appropriate measure of strength of association and interpret the same.

(5 marks)

9. Explain the situation for the application of logistic regression with the help of a suitable example.

(5 marks)

10. Draw an appropriate dummy table and give the formula for sensitivity, specificity, positive predictive value and negative predictive value.

(5 marks)

11. Explain in detail the format of reporting in scientific journals.

(10 marks)

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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – DECEMBER 2013

SUBJECT: IMMUNOLOGY AND IMMUNOLOGICAL TECHNIQUES

Thursday, December 19, 2013

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

- **Answer all the questions.**
- **Draw diagrams if necessary.**

1A. What is complement? Describe complement assays.

1B. Discuss innate immunity.

1C. Explain antigen processing.

(10×3 = 30 marks)

2. **Write notes on:**

2A. Detection of immune complexes

2B. Delayed type hypersensitivity skin tests

2C. Cytokines

2D. Lymphocytotoxicity test

2E. Monoclonal antibodies

(5×5 = 25 marks)

3. **Write short notes on:**

3A. ADCC

3B. Flow cytometry

3C. Kinin cascade

3D. IgA

3E. Recombinant vaccines

(3×5 = 15 marks)

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MANIPAL UNIVERSITY

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – DECEMBER 2013

SUBJECT: IMMUNOPATHOLOGY

Friday, December 20, 2013

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

- **Answer all the questions.**
- **Draw diagrams if necessary.**

1A. What is immunodeficiency? Describe one B cell immunodeficiency disorder.

1B. Explain the immunology and laboratory findings of AIDS.

1C. Define autoimmunity. Discuss organ specific autoimmune diseases.

(10×3 = 30 marks)

2. **Write notes on:**

2A. Diabetes mellitus

2B. Arthus reaction

2C. Sjogren's syndrome

2D. Warm antibody diseases

2E. Delayed hypersensitivity reactions

2F. Hemophilia

2G. Immunomodulators

(5×7 = 35 marks)

3. **Write short notes on:**

3A. Rheumatic fever

3B. Reaginic antibody

3C. ABO blood group system

3D. Types of graft

3E. Hay fever

(3×5 = 15 marks)