Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2018

SUBJECT: MOLECULAR BIOLOGY AND APPLIED GENETICS

Saturday, June 02, 2018

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

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

1A. Describe the DNA replication in prokaryotes. Add a note on.

1B. Give an outline of the process of cloning. Discuss the various cloning vectors.

1C. Explain the process of transcription in eukaryotes. Add a note on splicing.

(10 marks × 3 = 30 marks)

2. **Write detailed notes on:**

2A. Hemoglbinopathies

2B. Point mutations

2C. RFLP

2D. Human genome project

2E. Site directed mutagenesis

(5 marks × 5 = 25 marks)

3. **Write brief notes on:**

3A. Comparative genome hybridization

3B. Phenylketonuria

3C. Ames test

3D. DNA sequencing

3E. Recombinant vaccines

(3 marks × 5 = 15 marks)

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2018

SUBJECT: CLINICAL PATHOLOGY AND HAEMATOLOGY

Monday, June 04, 2018

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

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

1A. Define anemia. Discuss iron deficiency anaemia.

1B. Elaborate on clinical symptoms and laboratory diagnosis of multiple myeloma.

1C. Define haematopoiesis. Discuss erythropoiesis. Add a note on apoptosis.

(10 marks × 3 = 30 marks)

2. **Write detailed notes on:**

2A. Polycythemia Vera

2B. Hb F

2C. Pregnancy tests

2D. Platelet function test

2E. CML

(5 marks × 5 = 25 marks)

3. **Write short notes on:**

3A. Sickle cells

3B. Schilling test

3C. Anisocytosis

3D. Ringed sideroblasts

3E. Hay's test

(3 marks × 5 = 15 marks)

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2018

SUBJECT: IMMUNOPATHOLOGY

Wednesday, June 06, 2018

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

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

1A. Enumerate T cell deficiency disorders and discuss any one.

1B. Define and describe Anaphylaxis reaction.

1C. Define tumor marker. Discuss on Tumor and Tumor markers.

(10 marks × 3 = 30 marks)

2. **Write briefly on:**

2A. Myasthenia gravis

2B. Serum sickness

2C. Rheumatoid arthritis

2D. Multiple sclerosis

2E. Phagocytic defects

2F. Kidney transplantation

2G. Warm and cold antibody diseases

(5 marks × 7 = 35 marks)

3. **Write short notes on:**

3A. Infertility

3B. Food hypersensitivity reaction

3C. Compatibility testing

3D. Pernicious anemia

3E. Atopic eczema

(3 marks × 5 = 15 marks)

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2018

SUBJECT: CLINICAL BIOCHEMISTRY
(SPECIALIZATION: MICROBIOLOGY)

Friday, June 08, 2018

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

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

1A. What are the functions of kidney? Explain the various tests for renal glomerular function.

1B. What are the different sources of glucose in the blood? Enumerate the various methods of blood glucose estimation. Explain enzymatic methods.

1C. What is quality control? Discuss the internal quality control procedures.

(10 marks × 3 = 30 marks)

2. **Write detailed notes on:**

2A. Tests for function of liver in bilirubin metabolism.

2B. Isoenzymes and their clinical significance.

2C. Hypothyroidism and its diagnosis.

2D. Hazards from dangerous chemicals.

2E. Fractional test meal for gastric function.

(5 marks × 5 = 25 marks)

3. **Write brief notes on:**

3A. Serum lipid profile.

3B. Calibration of volumetric pipette by spectrophotometric method.

3C. Lundh meal test.

3D. Disposal of chemical waste.

3E. Urine sugar and ketone bodies.

(3 marks × 5 = 15 marks)

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2018

SUBJECT: GENERAL MICROBIOLOGY
(SPECIALIZATION: BIOCHEMISTRY)

Friday, June 08, 2018

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

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

1A. Describe the working principle of electron microscope. Write a note on scanning electron microscope.

1B. Classify sterilization methods. Discuss chemical disinfection in detail.

1C. Mention various methods of gene transfer occurring between bacteria and discuss on bacterial conjugation.

(10 marks × 3 = 30 marks)

2. **Write briefly on:**

2A. Pleomorphism and involution forms of bacteria

2B. Hot air oven

2C. E test

2D. Culture media

2E. Genetic mapping

(5 marks × 5 = 25 marks)

3. **Write short notes on:**

3A. Tyndallisation

3B. Koch postulates

3C. Ziehl Neelsen staining

3D. Stroke culture

3E. Plasmids

(3 marks × 5 = 15 marks)

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2018

SUBJECT: BIOMEDICAL TECHNIQUES

Monday, June 11, 2018

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

- **Draw diagram wherever necessary.**
- **Answer ALL questions.**

1. Classify electrophoresis. List the support media used in electrophoresis. Add a note on procedure and detection methods in gel electrophoresis.

(3+5+7 = 15 marks)

2. **Write detailed notes on:**

2A. Types of ion selective electrodes
2B. Column chromatography
2C. Inhibitors of electron transport chain
2D. Solid and liquid scintillation counters
2E. Nephelometry

(5 marks × 5 = 25 marks)

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FRIST YEAR MSC. RT / MOPT/MSc. ECG/MSc. CCIT/ MSc. NMT/ MSc. MLT/ MOT/ MSc. RRT & DT/ MASLP

SECOND SEMESTER M.Sc. MRP/MSc. EXERCISE AND SPORTS SCIENCE / M.Sc. MIT/ M.Sc. HIM/M.Sc. CLINICAL PSYCHOLOGY DEGREE EXAMINATION – MAY/JUNE 2018

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

Tuesday, May 29, 2018

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

✍ **Answer ALL the questions.**

1A. Define mean, median, mode, standard deviation and coefficient of variation.

1B. What do you mean by simple random sampling? Explain lottery method in simple random sampling with the help of an example.

(5+5 = 10 marks)

2A. Write two examples of Poisson random variable. Enumerate the properties of Poisson distribution.

2B. Define sampling distribution, standard error and confidence interval. Write two applications of standard error in inferential statistics.

(5+5 = 10 marks)

3A. Briefly explain the steps involved in one way ANOVA.

3B. A research team wants to know the prevalence of anaemia among primary school going children in a rural area in southern India. A previous study conducted few years before in the same population showed that the prevalence of anaemia among primary school children was 15%. What is the minimum sample size required if absolute precision (margin of error) is 3% and confidence level of 95%?

(5+5 = 10 marks)

4. Explain the structure of a research thesis.

(10 marks)

5. A sample of 160 women between 75 and 80 years old were classified into one of two groups based on whether they took Vitamin E supplements at the time of enrolment. Each woman was subsequently given a test to measure cognitive ability. Higher scores on this test indicate better cognition. The average test score amongst 60 women taking vitamin E was 27 with standard

deviation of 6.9 as compared to a mean score of 24 with a standard deviation of 6.2 among 100 women not taking the supplements. The research team wants to know whether the mean scores differ significantly between the two groups.

i) Name the statistical test used for comparing the mean scores between the two groups.
ii) What are the assumptions for this test?
iii) State the null and alternate hypothesis for this test?
iv) Compute the test statistic for this test.
v) State whether the test is one sided or two sided test. Justify your answer.

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

6. Explain the design, measure of strength of association, strength and weakness of cohort study design.

(10 marks)

7. **Write short notes on:**

7A. Wilcoxon signed rank test
7B. Cross sectional study design
7C. Logistic regression
7D. Validity of diagnostic tests

(5 marks × 4 = 20 marks)

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST YEAR M.Sc. M.L.T. DEGREE EXAMINATION – MAY/JUNE 2018

SUBJECT: IMMUNOLOGY AND IMMUNOLOGICAL TECHNIQUES

Thursday, May 31, 2018

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

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

1A. Enumerate primary and secondary lymphoid organs. Discuss on Thymus with the help of diagram.

1B. Define Inflammation. Describe the mechanism and mediators of Inflammation.

1C. Discuss on Histocompatibility testing.

(10 marks × 3 = 30 marks)

2. **Write briefly on:**

2A. Immune response

2B. Live and killed vaccines

2C. Western blotting

2D. Detection of immune complexes

2E. Hybridoma technique

(5 marks × 5 = 25 marks)

3. **Write short notes on:**

3A. NK cells

3B. Barriers of innate immunity

3C. Lectin pathway of complement activation

3D. Structure of T cell receptor

3E. Immnoelectrophoresis

(3 marks × 5 = 15 marks)