MANIPAL UNIVERSITY

SECOND YEAR M. Sc. M.L.T. DEGREE EXAMINATION – JUNE 2014

SUBJECT: GENERAL MICROBIOLOGY
(MICROBIOLOGY SPECIALIZATION)

Monday, June 02, 2014

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

✍ **Answer the following questions with the help of neat labeled diagrams wherever necessary.**

1. Define and classify sterilization. Discuss working principle, uses and sterilization controls of autoclave.

(5+10 = 15 marks)

2. Explain the methods involved in acquiring genetic information among bacteria.

(15 marks)

3. **Write briefly on:**

3A. Bacterial growth curve

3B. Investigation of hospital acquired infections

3C. Biological safety levels in clinical laboratory

3D. Molecular techniques for diagnosis of bacterial infections

3E. Anaerobic culture methods

(5 marks × 5 = 25 marks)

4. **Write short notes on:**

4A. Bacterial fimbriae

4B. Cold sterilization technique

4C. Minimum bactericidal concentration

4D. Dark ground microscopy

4E. Koch's postulates

(3 marks × 5 = 15 marks)
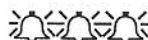
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SECOND YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2014

SUBJECT: CLINICAL BIOCHEMISTRY
(BIOCHEMISTRY SPECIALIZATION)

Monday, June 02, 2014

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

✍ **Answer all questions.**

✍ **Draw diagrams wherever necessary.**

1. What are the indications of kidney function tests? Discuss the etiology and laboratory diagnosis of Acute Kidney Injury?

(15 marks)

2. What are the preanalytical variables which can cause errors in clinical laboratory testing? Discuss the measures and procedures to be taken to control the errors due to preanalytical and analytical variables.

(15 marks)

3. **Write detailed notes on the following:**

3A. Various metabolic changes in Diabetes mellitus

3B. Discrete analyzers

3C. Hazards from dangerous chemicals and safety measures

3D. Differential diagnosis of jaundice

3E. Regulation of blood pH

(5 marks × 5 = 25 marks)

4. **Write brief notes on:**

4A. Histamine stimulation test

4B. Disposal of laboratory chemical waste

4C. Serum thyroxin and its significance

4D. Pancreatic amylase

4E. Urolithiasis

(3 marks × 5 = 15 marks)

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FIRST YEAR MOT/M.Sc. MLT/M.Sc. RT (NR)/MASTER OF OPTOMETRY/M.Sc. MIT/ M.Sc. ECHOCARDIOGRAPHY & (2012 PT)/MSc. CARDIAC CATHETERIZATION AND INTERVENTIONAL TECHNOLOGY DEGREE EXAMINATION – JUNE 2014

SUBJECT: ADVANCED BIOSTATISTICS & RESEARCH METHODOLOGY/BIOSTATISTICS/RESEARCH METHDOLOGY & BIOSTATISTICS/EPIDEMIOLOGY & BIOSTATISTICS

Tuesday, June 03, 2014

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

✍   **Answer ALL the questions.**

1A.   Define the various measures of dispersion.

1B.   Distinguish between sampling and non-sampling errors.

                                                                    (5+5 = 10 marks)

2A.   Write a short note on binomial distribution.

2B.   Define sampling distribution and standard error. A sample of 40 liver cirrhosis subjects were selected and the mean serum potassium level was observed to be 5.4 mEq/L with standard deviation of 1.8 mEq/L. Find the 99% confidence interval for mean serum potassium level among liver cirrhosis subjects. (The standard normal table value for 99% confidence level is 2.58).

                                                                    (5+ (2+3) = 10 marks)

3A.   Define type I error, type II error, Level of significance, Power and P value.

3B.   What do you mean by non-parametric tests? What are the advantages and disadvantages of non-parametric tests over parametric tests?

                                                                    (5+5 = 10 marks)

4.   Twenty four experimental animals with vitamin D deficiency were divided equally into two groups. Group 1 received treatment consisting of a diet that provided vitamin D. The second group was not given any treatment. At the end of the experimental period, serum calcium levels were measured with the following results.

Group	Mean (mg/100ml)	Standard deviation (mg/100ml)
Treated	11.1	1.5
Untreated	7.8	2.0

4A.   Name the statistical test used to test whether mean serum calcium levels differs significantly between the two groups.

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

4C.   What are the assumptions for this test?

4D.   Compute the test statistic value.

4E.   Briefly explain how do you take a decision about the acceptance or rejection of null hypothesis?

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

5A. A study was planned to find the prevalence of overweight among people in the age group of 40 to 50 years in an urban community. What is the minimum sample size required for the study if the absolute margin of error is fixed at 3% and confidence level of 95%? A similar study conducted three years before in the same population reported the prevalence of overweight as 18%. (The standard normal table for 95% confidence level is 1.96).

5B. What do you mean by blinding in RCTs? Briefly explain the various types of blinding.

(5+5 = 10 marks)

6. With the help of a flow chart explain the design of a case control study. Define the measure of strength of association between exposure and event in a case control study. Enumerate the advantages and disadvantages in a case control study.

(4+2+4 = 10 marks)

7A. In order to assess the validity of a diagnostic test, it was applied on 250 individuals with disease and 600 without disease. The test resulted in a positive diagnosis for 200 out of those with disease and 100 of those without disease. Construct appropriate 2 × 2 table and calculate sensitivity, specificity, positive predictive value and negative predictive value of the test.

7B. Write a short note on survival analysis.

(5+5 = 10 marks)

8. Explain the structure of a research protocol.

(10 marks)

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SECOND YEAR M. Sc. M.L.T. DEGREE EXAMINATION – JUNE 2014

SUBJECT: SYSTEMATIC BACTERIOLOGY AND MYCOLOGY
(MICROBIOLOGY SPECIALIZATION)

Wednesday, June 04, 2014

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

✍ **Answer the following questions with the help of neat labeled diagrams wherever necessary.**

1. Classify vibrios. Explain the pathogenesis and laboratory diagnosis of cholera.

(4+5+6 = 15 marks)

2. Based on morphology, classify medically important fungi with examples. Explain pathogenesis and laboratory diagnosis of respiratory infections caused by aspergillus.

(4+5+6 = 15 marks)

3. **Write briefly on:**

3A. Pathogenesis of tuberculus meningitis
3B. Laboratory diagnosis of dermatophytosis
3C. Serodiagnosis of enteric fever
3D. Pathogenesis and laboratory diagnosis of histoplasmosis
3E. Laboratory diagnosis of leptospirosis

(5 marks × 5 = 25 marks)

4. **Write short notes on:**

4A. Rhinosporidiosis
4B. Elek's test
4C. Pityriasis versicolor
4D. HP bodies
4E. Laboratory diagnosis of pneumocystosis

(3 marks × 5 = 15 marks)

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SECOND YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2014

SUBJECT: METABOLIC REGULATIONS AND INBORN ERRORS OF METABOLISM
(BIOCHEMISTRY SPECIALIZATION)

Wednesday, June 04, 2014

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

✍ **Answer ALL questions.**

✍ **Draw diagram wherever necessary.**

1.   Define and classify lipoproteins. Discuss metabolism of lipoproteins.
2.   What are trace elements? Discuss absorption and metabolism of Iron.

(15 marks × 2 = 30 marks)

3.   **Write detailed notes on:**

3A.   Biochemical function of pyridoxine

3B.   Glycogenolysis

3C.   Allosteric regulation and inhibition of enzyme action

3D.   Biochemical functions of thyroid hormones

3E.   Fatty liver

(5 marks × 5 = 25 marks)

4.   **Write short notes on:**

4A.   Toxicity of ammonia

4B.   Homocystinuria

4C.   Beriberi

4D.   Diabetes Mellitus

4E.   Regulation of citric acid cycle

(3 marks × 5 = 15 marks)

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SECOND YEAR M.Sc. M.L.T. DEGREE EXAMINATION – JUNE 2014

SUBJECT: APPLIED BIOCHEMISTRY
(BIOCHEMISTRY SPECIALIZATION)

Friday, June 06, 2014

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

✍ **Answer all Questions.**

✍ **Draw diagrams wherever necessary.**

1. Discuss the biochemical changes during HIV infection. Add a note on laboratory diagnosis of AIDS.

2. Elaborate on biochemistry of ageing. Add a note on Alzheimer's disease.

(15 marks × 2 = 30 marks)

3. **Write detailed notes on:**

3A. C-reactive protein

3B. Cocaine

3C. Sodium imbalance

3D. Organophosphate poisoning

3E. Arsenic compounds

(5 marks × 5 = 25 marks)

4. **Write brief notes on:**

4A. Alpha-1-anti trypsin

4B. Water intoxication

4C. Hypokalemia

4D. Ceruloplasmin

4E. Tobacco

(3 marks × 5 = 15 marks)

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✍ **Answer the following questions with the help of neat labeled diagrams wherever necessary.**

1. Classify arboviruses with examples. Discuss the etio-pathogenesis and laboratory diagnosis of dengue.

(4+7+4 = 15 marks)

2. Describe the life cycle and laboratory diagnosis of Toxoplasma gondii.

(8+7 = 15 marks)

3. **Write briefly on:**

3A. Laboratory diagnosis of Entamoeba histolytica
3B. Lysogenic cycle of bacteriophages
3C. Congenital rubella
3D. Laboratory diagnosis of malaria
3E. Structure of HIV

(5 marks × 5 = 25 marks)

4. **Write short notes on:**

4A. Negri bodies
4B. Hepatitis B virus vaccine
4C. Laboratory diagnosis of cryptosporidiosis
4D. Neurocysticercosis
4E. Pre exposure prophylaxis for rabies

(3 marks × 5 = 15 marks)

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