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Health Sciences Library

MANIPAL UNIVERSITY

THIRD YEAR B.Sc. N.M.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: IMMUNOLOGY, RADIOIMMUNOASSAY AND COUNTING STATISTICS

Tuesday, June 07, 2011

Time: 14:00-17:00 Hrs. Max. Marks: 80

✍ **Use same answer book for Section 'A' & Section 'B' and use separate answer book for Section 'C'.**

SECTION – A: IMMUNOLOGY

1. Write short notes on:

1A. Non Specific and Specific Immunity.

1B. Biological functions of Immunoglobulin.

1C. Direct and Indirect Immunofluorescence.

1D. Hypersensitivity Type I.

(5×4 = 20 marks)

SECTION – B: RADIOIMMUNOASSAY

2A. RIA-Example of Saturation Analysis.

2B. Radiolablelled ligand in RIA.

2C. Solid phase RIA.

2D. RIA Vs IRMA.

2E. Chemiluminiscence Assay.

2F. Non specific Binding and Sample Blank tubes.

2G. Sample collection in RIA.

2H. Logit log method for Data Processing.

2I. Control samples.

2J. High dose Hook effect.

(5×10 = 50 marks)

SECTION – C: COUNTING STATISTICS

3A. How can we divide the total time for counting background counts and gross sample counts so as to have minimum error in the net count rate?

3B. How will you compare two different counting systems?

(5×2 =10 marks)

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THIRD YEAR B.Sc. N.M.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: RADIATION BIOLOGY AND IN VITRO NUCLEAR MEDICINE

Thursday, June 09, 2011

Time: 14:00-17:00 Hrs. Max. Marks: 80

✍ **Answer all the questions.**

SECTION – 'A' : RADIATION BIOLOGY : 30 MARKS

1. Answer all the questions:

1A. Law of Bergonie and Tribondeau

1B. DNA structure

1C. Compton scatter

1D. GI syndrome

1E. Linear quadratic model

1F. Concept of LD 50

(5×6 = 30 marks)

SECTION – 'B' : IN VITRO NUCLEAR MEDICINE : 50 MARKS

✍ **Long Answers:**

2. Explain the various QC parameters in RIA. Is it possible to run NSB in solid phase RIA? Why?

(12+1+2 = 15 marks)

3. A patient has been admitted in the emergency department with a history of severe bleeding post surgery. How will you estimate the

3A. Total blood volume of the patient?

3B. In vivo cross matching

(10+5 = 15 marks)

4. **Write short notes on any FOUR:**

4A. Carbon breath analysis.

4B. Application of carbon breath analysis.

4C. Plasma iron clearance.

4D. Dual isotope testing for detection of vitamin B12 defeciency.

4E. Total Body Sodium estimation.

(5×4 = 20 marks)

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THIRD YEAR B.Sc. N.M.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: NUCLEAR MEDICINE INSTRUMENTATION

Saturday, June 11, 2011

Time: 14:00-17:00 Hrs. Max. Marks: 80

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1. Explain the various QC test for SPECT systems.

(20 marks)

2. Explain the following in brief:

2A. True Coincidence

2B. Scatter Coincidence

2C. Random Coincidence

(20 marks)

3. With a neat labeled diagram explain the working principle of Liquid Scintillation counters.

(20 marks)

4. **Write short notes:**

4A. MRI Vs CT

4B. Time of Flight

4C. List of data processing steps in SPECT

4D. Sample volume effect.

(5×4 = 20 marks)

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THIRD YEAR B.Sc. N.M.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: RADIOPHARMACY – II

Tuesday, June 14, 2011

Time: 14:00-15:30 Hrs. Max. Marks: 40

Answer all the questions.

1. Write about the Indium radiopharmaceuticals. Compare Ga and In for their application in Infection imaging.

(7+3 = 10 marks)

2. Mention the various Cardiac agents for Scintiscanning. Explain the 99mTc-myocardial perfusion agents.

(2+8 = 10 marks)

3. **Write short notes on:**

3A. Renal static agents.

3B. 99mTc Bone agents.

3C. Chloramine T method.

3D. ^{123}I, ^{125}I and ^{131}I.

(5×4 = 20 marks)