

MANIPAL UNIVERSITY

PG DIPLOMA IN NUCLEAR MEDICINE TECHNOLOGY EXAMINATION – MAY/JUNE 2012

SUBJECT: CLINICAL NUCLEAR MEDICINE TECHNIQUES

Monday, May 28, 2012

Time: 10:00-13:00 Hrs.

Max. Marks: 80

✍ **Answer ALL questions.**

1. A patient is suspected of Hyperparathyroidism and has been referred to rule out parathyroid adenoma. Write in detail –
 - 1A. Three radiopharmaceuticals and their characteristics
 - 1B. Protocol for dual isotope technique based parathyroid imaging
 - 1C. Interpretation of study

(9+8+3 = 20 marks)

2. A male patient suffering from fullness of the stomach after food has been referred for gastric emptying study for liquids. Write about -
 - 2A. Patient preparation
 - 2B. Preparation of the liquid meal
 - 2C. Acquisition protocol
 - 2D. Interpretation of the study

(4+5+7+4 = 20 marks)

3. A 56 years old healthy male with a complaint of left sided chest pain is suspected to have coronary artery disease. He has been referred for Exercise 201-Thallium myocardial perfusion imaging. Write down following in detail –
 - 3A. Preparation of radiopharmaceutical
 - 3B. Radiopharmaceutical dose
 - 3C. Which is the critical organ?
 - 3D. Patient preparation, Stress and Rest Imaging protocol
 - 3E. Interpretation of the study

(2+2+2+12+2 = 20 marks)

4. **Write short notes:**
 - 4A. In vitro tagging of RBC with pertechnetate
 - 4B. Indirect VUR study
 - 4C. Lasix
 - 4D. Ethyl Cysteine

(5×4 = 20 marks)



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MANIPAL UNIVERSITY

PG DIPLOMA IN NUCLEAR MEDICINE TECHNOLOGY EXAMINATION – MAY/JUNE 2012

SUBJECT: THERAPEUTIC NUCLEAR MEDICINE PROCEDURES

Wednesday, May 30, 2012

Time: 10:00-13:00 Hrs.

Max. Marks: 80

✍ **Answer ALL questions.**

1. Long questions:

- 1A. A patient diagnosed to have multiple osteoblastic skeletal metastasis has been referred for pain palliation. Discuss the therapeutic radionuclides used for such patient.
- 1B. Discuss the therapeutic radionuclides used for treating patients suffering from recurrent malignant ascitis and describe the procedure protocol of such therapy.
- 1C. What is a low dose I-131 scan, a large dose I-131 scan and post-therapy I-131 scan? Discuss their utility in the management of differentiated thyroid cancer.

(20×3 = 60 marks)

2. Short notes:

- 2A. Ideal characteristics of a therapeutic radionuclide.
- 2B. Ideal characteristics of pharmaceutical used for radiation synovectomy.
- 2C. Patient preparation for ¹³¹I MIBG therapy.
- 2D. TLD.

(5×4 = 20 marks)



MANIPAL UNIVERSITY**PG DIPLOMA IN NUCLEAR MEDICINE TECHNOLOGY EXAMINATION – MAY/JUNE 2012****SUBJECT: HEALTH PHYSICS AND RADIATION PROTECTION**

Friday, June 01, 2012

Time: 10:00-13:00 Hrs.

Max. Marks: 80

1. Answer any FOUR of the following questions:

- 1A. Write briefly about Maximum permissible radiation dose to occupationally exposed radiation workers and general population at large.
- 1B. Write a short note on management of radioactive waste in Nuclear Medicine department of a hospital.
- 1C. Define cumulated activity. How will you calculate cumulated activity if the uptake is instantaneous and the elimination are governed by both physical and biological decay?
- 1D. Write about the important features of Type B package.
- 1E. When misadministration does occurs? How can you prevent them?

(5×4 = 20 marks)

2. Answer all the questions:

2. What are the main features involved in planning a Nuclear Medicine lab? Give a typical plan of a Nuclear Medicine lab having RIA counter, a gamma camera and associated radio pharmacy work for diagnostic procedures. What are the minimum requirements for the above work?

(20 marks)

3. Write in detail about various personnel monitoring devices.

(20 marks)

4. Briefly define or explain:

- 4A. Activity
- 4B. Exposure
- 4C. KERMA
- 4D. Equivalent dose
- 4E. Effective dose
- 4F. ALI
- 4G. DAC
- 4H. Specific gamma ray constant
- 4I. Absorbed fraction
- 4J. Effective half life

(2×10 = 20 marks)



MANIPAL UNIVERSITY

PG DIPLOMA IN NUCLEAR MEDICINE TECHNOLOGY EXAMINATION – MAY/JUNE 2012
 SUBJECT: BIOSTATISTICS AND RESEARCH METHODOLOGY AND ADVANCES IN NUCLEAR MEDICINE

Monday, June 04, 2012

Time: 10:00-13:00 Hrs.

Max. Marks: 80

✍ Use two separate answer books for SECTION 'A' & SECTION 'B'.

SECTION – A: BIOSTATISTICS AND RESEARCH METHODOLOGY (40 MARKS)

1. Define ordinal and nominal variable with examples. (4 marks)

2. Categorize the following based on the scales of measurement (Nominal, Ordinal, Interval and Ratio)
 - a) Blood pressure b) Hospital Number c) Age d) Pain Score(4 marks)

3. What percent of the observations lie within two standard deviation from the mean? (2 marks)

4. **Write a short note on:**
 - 4A. Non probability sampling.
 - 4B. Aims and uses of epidemiology.(5×2 = 10 marks)

- 5A. The CD4 T cell counts ($\times 10^6 / l$) at base line for 10 – HIV positive subjects are as follows:
 230 210 313 173 158 103 181 115 301 216
 Calculate mean, standard deviation and coefficient of variation.
- 5B. Compute median and interquartile range for the following data regarding the number of post operative days until diagnosis of the infection for each subject experiencing an infection.
 16 10 19 15 7 12 8 19 11 18 13 17
(8×2 = 16 marks)

6. Construct a bar chart for the following data.

Blood Group	O	A	B	AB
Number of persons	90	40	100	70

(4 marks)

SECTION – B: ADVANCES IN NUCLEAR MEDICINE (40 MARKS)

✍ Answer all questions.

7. Discuss the advances in the development of radiopharmaceuticals for Bone imaging. (20 marks)

8. Discuss the advances in the development of Radionuclide Generators. (20 marks)

