

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0122]

**JANUARY 2022
(OCTOBER 2021 EXAM SESSION)**

Sub. Code: 2316

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY
SECOND YEAR (From 2019-2020 onwards)
PAPER VI - HEALTH PHYSICS AND & RADIATION PROTECTION
*Q.P. Code : 282316***

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Explain in detail about the
 - a) Duties of NM Technologist
 - b) Responsibilities of RSO
 - c) Responsibilities of licensee
2. Explain in detail about the
 - a) Radioactive waste management in NM lab
 - b) Emergency preparedness in nuclear medicine

II. Write Short Notes on:

(10x6 = 60)

1. Committed Dose.
2. Dose reciprocity theorem.
3. MIRD.
4. Management of Radiation injuries.
5. Decontamination procedure.
6. Sterilization methods.
7. Principle of Asepsis.
8. Misadministration of I131 10mCi radiopharmaceutical to a patient – Management.
9. AERB recommended dose limits for radiation worker & public.
10. Transport index of a radiopharmaceutical.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1022]

OCTOBER 2022

Sub. Code: 2316

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY
SECOND YEAR
(Candidates admitted from 2019-2020 & 2020-2021 onwards)
PAPER VI – HEALTH PHYSICS AND RADIATION PROTECTION**

Q.P. Code: 282316

Time: Three hours

Maximum: 100 Marks

Answer ALL Questions

I. Elaborate on:

(2 x 20 = 40)

1. Explain in detail:
 - a) Regulatory requirements for registering radioactive sources.
 - b) Responsibilities of NM technologist and Medical Physicist.
2. Explain in detail planning and installation of a gamma camera in NM as per AERB.

II. Write notes on:

(10 x 6 = 60)

1. Management of radioactive spills in NM.
2. Radioactive waste management in NM lab.
3. AERB recommended radiation dose limit for occupational worker and public.
4. Precautions during administration of radiopharmaceutical to children and nursing mothers.
5. Evaluation of radiation hazards.
6. As per AERB, what is considered as misadministration?
7. Define committed dose and explain its significance.
8. Radiation surveillance of NM lab and permitted leakage levels by AERB.
9. How to manage a radiation emergency?
10. Basic principles of radiation safety.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1023]

OCTOBER 2023

Sub. Code: 2316

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY
SECOND YEAR (From 2020-2021 onwards)
PAPER VI – HEALTH PHYSICS AND RADIATION PROTECTION**

Q.P. Code: 282316

Time: Three hours

Maximum: 100 Marks

Answer ALL Questions

I. Elaborate s on:

(2 x 20 = 40)

1. Explain in detail
 - a) Radiation protection in NM.
 - b) Contamination levels as per AERB.
 - c) Radiation worker.
 - d) Responsibilities of licensee.
2. Explain in detail the planning and installation of PET in a NM facility in a Healthcare center as per AERB requirements.

II. Write notes on:

(10 x 6 = 60)

1. Records to be maintained in NM lab.
2. Transport index of a radiopharmaceutical.
3. Misadministration: Types, Causes and Prevention.
4. Preparation of different radiopharmaceuticals.
5. Precautions for administering radiopharmaceutical to pregnant women.
6. Radiation measuring instruments that should be made available in working condition at a NM facility.
7. Decommissioning and disposal of radioactive sources.
8. Annual Limit on Intake (ALI) and committed dose.
9. Emergency procedures for radioactive spillage.
10. Radiation hazard evaluation.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1024]

OCTOBER 2024

Sub. Code: 2316

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY
SECOND YEAR (From 2020-2021 onwards)
PAPER VI – HEALTH PHYSICS AND RADIATION PROTECTION**

Q.P. Code: 282316

Time: Three hours

Maximum: 100 Marks

Answer ALL Questions

I. Elaborate on:

(2 x 20 = 40)

1. Explain in detail the planning and installation of a PET CT camera as per the AERB regulations.
2. Personnel Radiation Monitors. Explain the principle and working of each type.

II. Write notes on:

(10 x 6 = 60)

1. Decontamination methods.
2. Gamma zone monitor and its usage.
3. Explain Committed equivalent dose and Committed effective dose.
4. Enumerate on “Misadministrations” in Nuclear Medicine.
5. How do you manage a Radiation Emergency?
6. TREM (Transport Emergency) card and its usage.
7. Wipe test and its application in Nuclear Medicine.
8. LET and the factors that influence it.
9. Types of Radioactive packages.
10. Acute Radiation syndrome.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1025]

OCTOBER 2025

Sub. Code: 2316

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY
SECOND YEAR (From 2020-2021 onwards)
PAPER VI – HEALTH PHYSICS AND RADIATION PROTECTION**

Q.P. Code: 282316

Time: Three hours

Maximum: 100 Marks

Answer ALL Questions

I. Elaborate on:

(2 x 20 = 40)

1. (a) Precautions to be followed during administration of radiopharmaceuticals to children and lactating mothers.
(b) What is the misadministration? How do you deal with misadministration?
2. Explain in detail, planning and installation of a Single Photon Emission Computed Tomography (SPECT) with Computed Tomography (SPECT CT) as per regulations in India.

II. Write notes on:

(10 x 6 = 60)

1. What are the different types of radioactive waste generated in nuclear medicine department and how do you manage it?
2. What are the different types of radioactive spillages usually occurred in the nuclear medicine department and how do you manage it?
3. Annual Dose limits for occupational radiation workers, trainee radiation workers and the public.
4. Role of Radiological Safety Officer (RSO) and Licensees as per AERB Safety code.
5. Annual Limit on Intake (ALI) & Derived Air Concentration (DAC).
6. Explain Absorbed, Equivalent and Effective Dose.
7. Why is a fume hood required during the administration of radioiodine and radio-iodination?
8. (a) What do you understand about physical half-life, biological half-life & effective half-life and their relationships?
(b) What is the “mean life “of a radioactive material?
9. (a) What is Transport Index (TI)? (b) How do you find TI? (c) Relevance of TI in transport of radioactive consignments.
10. (a) Why do you need a delay tank for High Dose Therapy facility (HDT)? (b) How do you discharge delay tank effluent?
