

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

[AHS 0222]

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

**Sub. Code: 2307**

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY  
FIRST YEAR**

**(Candidates admitted from 2019-2020 onwards – Paper VII)**

**(Candidates admitted from 2020-2021 onwards – Paper VIII)**

**PAPER VII & VIII – RADIOPHARMACY - I**

***Q.P. Code : 282307***

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate notes on:**

**(2 x 20 = 40)**

1. Rb<sup>82</sup> generator system.
2. Production of N<sup>13</sup> in cyclotron.

**II. Write Short Notes on:**

**(10x6 = 60)**

1. Mechanism of Tc<sup>99m</sup>ECD complex.
2. Enumerate on wet and dry generator Tc99m system.
3. Tc99mPlatlet labeling methods.
4. Formulation of Tc99mMIBI.
5. Chemical structures of Tc99mTetrofosmin, Tc99mMDP.
6. Thin layer chromatography & Retardation factor.
7. Criteria's for selecting Radionuclide's for therapy and diagnostic nuclear medicine.
8. Modified In-Vitro RBC labeling method.
9. Synthesis of <sup>18</sup>FDG.
10. Tc99m Sulphur colloid labeling for Lymphoscintigraphy.

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

[AHS 0522]

MAY 2022

Sub. Code: 2307

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY  
FIRST YEAR**

(Candidates admitted from 2019-2020 onwards – Paper VII)

(Candidates admitted from 2020-2021 onwards – Paper VIII)

**PAPER VII & VIII – RADIOPHARMACY - I**

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**M.Sc. NUCLEAR MEDICINE TECHNOLOGY  
FIRST YEAR**

**(Candidates admitted from 2019-2020 onwards - Paper - VII)  
(Candidates admitted from 2020-2021 onwards – Paper - VIII)**

**PAPER VII & VIII – RADIOPHARMACY - I**

*Q. P. Code: 282307*

**Time: Three hours**

**Maximum : 100 Marks**

**Answer ALL Questions**

**I. Elaborate on:** **(2 x 20 = 40)**

1. Cyclotron and Reactor produced radionuclides with suitable examples.
2. Importance of PET radiopharmacy and Radiochemistry.

**II. Write notes on:** **(10 x 6 = 60)**

1. Chemistry of <sup>99m</sup>-Technetium.
2. <sup>68</sup>Ge – <sup>68</sup>Ga Generator.
3. Difference between Dry, Wet and Gel Type Generator.
4. Labeling method for ECD and TRODAT.
5. Criteria for selection of the radionuclides for therapy.
6. Parent-daughter equilibrium.
7. Stronger and weaker ligands with examples.
8. Radiopharmaceutical for spleen study.
9. Short lived radionuclides.
10. Specific activity.

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

[AHS 1023]

OCTOBER 2023

Sub. Code: 2307

M.Sc. NUCLEAR MEDICINE TECHNOLOGY  
FIRST YEAR (From 2020-2021 onwards)  
PAPER VIII – RADIOPHARMACY - I

*Q. P. Code: 282307*

**Time: Three hours**

**Maximum : 100 Marks**

**Answer ALL Questions**

**I. Elaborate on:**

**(2 x 20 = 40)**

1. Solvent extraction, Column and Gel type generator.
2. Synthesis of PET radiopharmaceuticals.

**II. Write notes on:**

**(10 x 6 = 60)**

1. Additives and preservatives.
2. Reactor produced radionuclide.
3. Oxidation states of  $^{99m}\text{Tc}$  in  $^{99m}\text{Tc}$  Radiopharmaceuticals.
4. Basic principle of  $^{99m}\text{Tc}$ -Labelled Red Blood Cells.
5.  $^{82}\text{Sr}$ -  $^{82}\text{Rb}$  Generator.
6. Transient and Secular Equilibrium.
7. Difference between Colloid and MAA particles.
8. Myocardial imaging Tracer for SPECT and PET.
9. Specific Activity.
10. Cyclotron produced radionuclide.

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

[AHS 1024]

OCTOBER 2024

Sub. Code: 2307

M.Sc. NUCLEAR MEDICINE TECHNOLOGY  
FIRST YEAR (From 2020-2021 onwards)  
PAPER VIII – RADIOPHARMACY - I

*Q. P. Code: 282307*

**Time: Three hours**

**Maximum: 100 Marks**

**Answer ALL Questions**

**I. Elaborate on:**

**(2 x 20 = 40)**

1. Production of  $N^{13}$  in cyclotron.
2.  $Ge^{68} - Ga^{68}$  generatorsystem.

**II. Write notes on:**

**(10 x 6 = 60)**

1. Heat damaged  $Tc^{99m}$  RBCs.
2. Passive diffusion mechanism with examples.
3. Radio iodination method.
4. Mechanism of  $^{18}F$  FDG.
5. Ascending chromatography.
6. Carrier Free Radionuclides.
7. Formulation of  $Tc^{99m}$  MIBI.
8.  $Tc^{99m}$  sulphur colloid labeling for lymphoscintigraphy.
9. Physical and chemical characteristics of  $Tc^{99m}$  Tetrofosmin.
10. Criteria for selecting radionuclides for Therapy and Diagnostic nuclear medicine.

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

[AHS 1025]

OCTOBER 2025

Sub. Code: 2307

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY  
FIRST YEAR (From 2020-2021 onwards)  
PAPER VIII – RADIOPHARMACY - I**

*Q. P. Code: 282307*

**Time: Three hours**

**Maximum: 100 Marks**

**Answer ALL Questions**

**I. Elaborate on:**

**(2 x 20 = 40)**

1. Criteria for selection of the radionuclides for diagnosis and therapy.
2. Construction of a Solvent extraction and the other contaminants involved in it.

**II. Write notes on:**

**(10 x 6 = 60)**

1. Short-Lived radionuclide.
2. Chemistry of  $^{99m}\text{Tc}$ .
3. Production of  $^{67}\text{Ga}$ .
4. Radioiodination for Mibg.
5. Common additive used in  $^{99m}\text{Tc}$ -Sulfur colloid.
6. Alumina and Mo99 Breakthrough test.
7. Separation of  $^{99}\text{Mo}$  from  $^{235}\text{U}$ .
8. Usage of cadmium rods and graphite.
9. RF factor in Radiopharmacy.
10.  $^{99m}\text{Tc}$  Content in  $^{99m}\text{Tc}$ -Elate.

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