

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

[AHS 0222]

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

Sub. Code: 2303

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

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

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

PAPER III & IV – MATHEMATICS AND STATISTIC

Q.P. Code : 282303

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Describe the uses of student-t-tests with examples.
2. a) What is the medical decision making and principle of receiver operating Characteristic (ROC)?
b) Explain in detail about types of data with example.

II. Write Short Notes on:

(10x6 = 60)

1. Explain about normal distribution with example.
2. What are most commonly used continuous functions in nuclear medicine?
3. What are the methods used to describe dispersion of data.
4. Explain the concept of correlation with example.
5. Explain coordinate system and its types.
6. Explain Mann Whitney U test .
7. Explain Chi-square test.
8. Explain mean, median and mode with example.
9. Methods of least square fitting.
10. Explain parametric functions.

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

[AHS 0522]

MAY 2022

Sub. Code: 2303

M.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

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

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

PAPER III & IV – MATHEMATICS AND STATISTIC

Q.P. Code : 282303

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Describe the uses of student-t-tests with examples.
2. a) What is the medical decision making and principle of receiver operating Characteristic (ROC)?
b) Fourier Transform and its application in nuclear medicine.

II. Write Short Notes on:

(10x6 = 60)

1. Explain about normal distribution with example.
2. What are most commonly used continuous functions in nuclear medicine?
3. What are the methods used to describe dispersion of data.
4. Explain the concept of correlation with example.
5. Explain coordinate system and its types.
6. Explain about simple back projection.
7. Explain Chi-square test.
8. Explain about filtered back projection.
9. Methods of least square fitting.
10. Explain parametric functions.

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

[AHS 1022]

OCTOBER 2022

Sub. Code: 2303

M.Sc. NUCLEAR MEDICINE TECHNOLOGY

FIRST YEAR

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

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

PAPER IV – MATHEMATICS & STATISTIC

Q.P. Code : 282303

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Explain the Difference between Parametric and Nonparametric Test. List out tests in each type.
2. What are most commonly used discrete and continuous functions in nuclear medicine?

II. Write Short Notes on:

(10x6 = 60)

1. Correlation with an example.
2. Continuous distribution and its types.
3. Methods of least square fitting.
4. Coordinate system and its types.
5. Chi-square test with an example.
6. Simple and filtered back projection.
7. Fourier Transform and its application.
8. Kruskal Wallis test with example.
9. Graphical representation of a complex number.
10. Decision making and principle of receiver operating Characteristic (ROC).

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

[AHS 1023]

OCTOBER 2023

Sub. Code: 2303

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (From 2020-2021 onwards)
PAPER IV – MATHEMATICS & STATISTIC**

Q.P. Code: 282303

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Explain the following: i) Euler's equation, ii) Fourier Transforms, iii) Modulation Transfer Function & iv) Laplace Transform.
2. Explain the Mean, Mode, Median and Standard Deviation with a suitable example.

II. Write Short Notes on:

(10x6 = 60)

1. Explain the Mann-Whitney U test.
2. Explain the concept of correlation and regression.
3. Explain parametric functions.
4. Methods of the least square fitting.
5. State the power rule of differentiation with an example.
6. Rules of differentiation.
7. Complex numbers.
8. Students-t-test.
9. Analysis of variance.
10. Specificity, sensitivity and accuracy.

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

[AHS 1024]

OCTOBER 2024

Sub. Code: 2303

**M.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (From 2020-2021 onwards)
PAPER IV – MATHEMATICS & STATISTICS**

Q.P. Code: 282303

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. a) What is the medical decision-making and principle of Receiver Operating Characteristic (ROC)? b) Explain in detail about types of data with an example.
2. Fourier Transform and its application in nuclear medicine.

II. Write Short Notes on:

(10x6 = 60)

1. Explain normal distribution with an example.
2. Explain the Mann-Whitney U test.
3. Explain mean, median and mode with examples.
4. Modulation Transfer Function.
5. Analysis of variance.
6. Specificity, sensitivity, accuracy.
7. Definite integral and its properties.
8. Complex numbers.
9. Functions and limits.
10. Chi-square.

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

[AHS 1025]

OCTOBER 2025

Sub. Code: 2303

M.Sc. NUCLEAR MEDICINE TECHNOLOGY
FIRST YEAR (From 2020-2021 onwards)
PAPER IV – MATHEMATICS & STATISTICS

Q.P. Code: 282303

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Explain the concept and application of differential equations in compartment analysis.
2. Describe the laws of probability and explain Binomial, Poisson and Normal distributions in detail.

II. Write Short Notes on:

(10x6 = 60)

1. Define and explain the rules of differentiation.
2. Describe the properties of definite integrals.
3. What is the concept of vector product? Explain with examples.
4. Explain ROC curve with example.
5. What is the Student's test? State its uses.
6. Discuss sensitivity, specificity and accuracy in statistical testing.
7. Write a note on De Moivre's theorem and its applications.
8. Explain correlation and regression lines with an example.
9. Differentiate between mean, median and mode with example.
10. Discuss curve fitting using the method of least squares.
