B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
(New Syllabus 2018-2019)

FIRST YEAR

PAPER II – GENERAL PHYSICS, RADIATION PHYSICS AND PHYSICS OF DIAGNOSTIC RADIOLOGY

Q.P. Code: 801842

Time : Three Hours **Maximum : 100 Marks**

Answer All questions.

I. Elaborate on: **(3 x 10 = 30)**

1. Explain the production of X rays with neat diagram.
2. Write in detail the various modes (α, β and γ) of radioactive decay.
3. Explain the various factors that affect the quantity and quality of X rays.

II. Write notes on: Answer any 8 out of 10 questions **(8 x 5 = 40)**

1. What is photoelectric effect? Its relevance in diagnostic radiology.
2. Explain the effect of scattered radiation on radiograph image quality and how to reduce it?
3. Describe about the self-induction and mutual induction.
4. Draw the rotating anode X ray circuit and explain its parts.
5. Explain the mA control circuit.
6. Describe the principle of auto transformer.
7. Describe the constituents of intensifying screens.
8. Write any five properties of X rays.
9. Write about the artificial production of radionuclides.
10. What is pair production? Explain the annihilation process.

III. Short answers on: **(10 x 3 = 30)**

1. Define atomic number.
2. Define isobar.
3. What is line focus principle?
4. What is thermionic emission?
5. Define faraday's law.
6. What is focusing cup?
7. Define electric current and its unit.
8. Define power and its unit.
9. What is advantage of rotating anode over stationary anode?
10. What is focal spot?

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[LQ 0220] FEBRUARY 2020 **Sub Code: 1842**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
(New Syllabus 2018-2019)

FIRST YEAR

PAPER II – GENERAL PHYSICS, RADIATION PHYSICS AND PHYSICS OF DIAGNOSTIC RADIOLOGY

Q.P. Code: 801842

Time : Three Hours **Maximum : 100 Marks**

Answer All questions.

I. Elaborate on: **(3 x 10 = 30)**

1. Explain with the help of neat diagram the construction and working of modern X-ray tube.
2. Write in detail about photo electric effect and its significance in diagnostic radiology.
3. Describe in detail, various types of grids used in diagnostic radiology.

II. Write notes on: **(8 x 5 = 40)**

1. Electromagnetic radiation.
2. Laws of electromagnetic induction.
3. Artificial radioactivity.
4. Full wave rectifier circuit and its function.
5. Beam limiting devices.
6. Construction and function of intensifying screen.
7. Explain alpha decay and beta decay.
8. X-ray filtration.

III. Short answers on: **(10 x 3 = 30)**

1. Einstein’s formula.
2. Nucleus.
3. Step up transformer.
4. Electric current and its unit.
5. Units of radioactivity.
6. Half value layer.
7. X-ray tube housing.
8. Grid ratio.
9. Quantum mottle.
10. Types of cassette.

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

[AHS 0321] MARCH 2021 Sub. Code: 1842

(AUGUST 2020 EXAM SESSION)

B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY

FIRST YEAR (Regulation 2018-2019)

PAPER II – GENERAL PHYSICS, RADIATION PHYSICS AND PHYSICS OF DIAGNOSTIC RADIOLOGY

Q.P. Code : 801842

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Interaction of X and Gamma radiation with matter.
2. Explain Bremstralung and Characteristic X ray Spectrum.
3. Discuss in detail about Beam limiting devices.

II. Write notes on: **(8 x 5 = 40)**

1. With diagram explain Atomic Structure.
2. Discuss the working principle of Thermo luminescence Dosimeter
3. Write short note about Transformer
4. Discuss the principle of Ionization Chamber
5. Heel effect of an X ray tube
6. Factors that affect the quality and intensity of X rays.
7. Explain about Radioactive disintegration
8. Full wave rectifier.

III. Short answers on: **(10 x 3 = 30)**

1. What is the law of conservation of energy.
2. Isotope
3. Properties of target material
4. Mass Energy
5. What is the main advantage of rotating anode over Stationary anode
6. Relation bwtween HVL AND LAC
7. Radioactive decay
8. Define Bequerel
9. Define Artificial radioactivity
10. Define Sievert

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

[AHS 0422] APRIL 2022 Sub. Code: 1842

(FEBRUARY 2021 & AUGUST 2021 EXAM SESSIONS)

B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY

FIRST YEAR (Regulation 2018-2019)

PAPER II – GENERAL PHYSICS, RADIATION PHYSICS &PHYSICS OF DIAGNOSTIC RADIOLOGY

Q.P. Code: 801842

Time: Three Hours **Maximum : 100 Marks**

Answer All questions

I. Elaborate on : **(3X10=30)**

1. Explain about the high tension generator circuit for X-ray production.
2. Explain about the various types of grids.
3. Write down the theory of working of transformers. Explain about the various transformer losses.

II. Write Notes on : **(8X5=40)**

1. Properties of X-rays.
2. Ionisation and Excitation.
3. Full wave rectifier.
4. Relation between HVL and linear attenuation coefficient.
5. Write about continuous spectrum and characteristic spectrum.
6. Principle of line focus.
7. Types of radioactivity with example.
8. Properties of gamma rays.

III. Short Answers on: **(10X3=30)**

1. Fundamental unit.
2. Ohms law.
3. Inverse square law of X-rays.
4. Half life.
5. Mass defect.
6. Heel effect.
7. Define Power and energy.
8. Units of temperature.
9. Isotope.
10. Define Becquerel.

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

[AHS 1122] **NOVEMBER 2022** **Sub. Code: 1842**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
FIRST YEAR (Regulation 2018-2019)
PAPER II – GENERAL PHYSICS, RADIATION PHYSICS & PHYSICS OF DIAGNOSTIC RADIOLOGY
Q.P. Code: 801842

Time: Three Hours **Maximum : 100 Marks**

Answer All questions

I. Elaborate on : **(3X10=30)**

1. Explain about the working of Modern X-ray tube with a neat diagram.
2. Explain about the working and various types of transformers.
3. Write down the properties of α, β and γ rays.

II. Write Notes on : **(8X5=40)**

1. Photoelectric effect.
2. Capacitor and Capacitance.
3. Photoelectric absorption.
4. Factors affecting the quality of X-rays.
5. Filtration.
6. Types of grids.
7. Mass defect and Binding energy.
8. Intensifying screen.

III. Short Answers on: **(10X3=30)**

1. S.I unit of electric current and force.
2. Space charge effect.
3. Half life of any two isotopes used in Medicine.
4. Lenz's law.
5. Define Power and its unit.
6. Nuclear Fission.
7. Mass attenuation coefficient.
8. Specific activity.
9. Rare earth screen.
10. Define Curie.

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

[AHS 0423] **APRIL 2023** **Sub. Code: 1842**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
FIRST YEAR (Regulation 2018-2019 onwards)
PAPER II – GENERAL PHYSICS, RADIATION PHYSICS & PHYSICS OF DIAGNOSTIC RADIOLOGY
Q. P. Code: 801842

Time: Three hours **Maximum : 100 Marks**

Answer ALL Questions

I. Elaborate on: **(3 x 10 = 30)**

1. Elaborate the production of X-ray with a neat diagram.
2. Describe any one X-ray circuit with a neat sketch.
3. Discuss the Bremsstrahlung and characteristic X- ray spectrum.

II. Write notes on: **(8 x 5 = 40)**

1. Define Line focus principle.
2. Explain the transformers theory and loss.
3. Explain the Gamma ray sources of medical uses.
4. Explain HVT and TVT.
5. Compton Effect.
6. Define Linear and mass attenuation coefficient.
7. Latitude and Emulsion absorption.
8. Bean Restrictors.

III. Short answers on: **(10 x 3 = 30)**

1. Grid factor.
2. Define Fleming's Right hand rule.
3. Define Characteristic radiation.
4. What is the purpose of Vacuum in the X-ray tube?
5. What is X-ray generator?
6. What is Kerma and absorbed dose?
7. What is Non screen film?
8. Define Half Life period.
9. X-ray cassette.
10. Define Thermoluminescence effect.

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

[AHS 1123] **NOVEMBER 2023** **Sub. Code: 1842**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
FIRST YEAR (Regulation 2018-2019 onwards)
PAPER II – GENERAL PHYSICS, RADIATION PHYSICS & PHYSICS OF DIAGNOSTIC RADIOLOGY
Q.P. Code: 801842

Time: Three Hours **Maximum : 100 Marks**

Answer All questions

I. Elaborate on : **(3 X 10 = 30)**

1. Explain about production of X-ray with a neat diagram.
2. Explain about the various modes of radioactive decay with example.
3. Write about beam limiting devices.

II. Write Notes on : **(8 X 5 = 40)**

1. Properties of electromagnetic radiation.
2. Bohr's Atomic model.
3. Half wave rectifier.
4. Properties of Alpha (α) rays.
5. Attenuation and Absorption.
6. Auto transformer.
7. Filament circuit.
8. Intensifying screen.

III. Short Answers on: **(10 X 3 = 30)**

1. Inherent filtration.
2. Coulomb's law.
3. Binding energy.
4. Thermionic emission.
5. Mass number and atomic number.
6. Write any three medical uses of artificial radioisotopes.
7. Define Work and write down its unit.
8. Half value thickness.
9. Nuclear Fusion.
10. Grid ratio.

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

[AHS 0424] **APRIL 2024** **Sub. Code: 1842**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
FIRST YEAR (Regulation 2018-2019 onwards)
PAPER II – GENERAL PHYSICS, RADIATION PHYSICS & PHYSICS OF DIAGNOSTIC RADIOLOGY
Q.P. Code: 801842

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : **(3 X 10 = 30)**

1. Describe the working of Rotating Anode X-ray tube with neat diagram.
2. Interaction of Radiation with matter.
3. Describe in detail about the types of X-ray cassette.

II. Write Notes on: **(8 X 5 = 40)**

1. Capacitor and Capacitance.
2. Radioactive decay constant.
3. Properties of X-rays.
4. Auto transformer.
5. Full wave rectifier.
6. Photo electric effect.
7. Automatic exposure control.
8. Quality and Quantity of X-rays.

III. Short Answers on : **(10 X 3 = 30)**

1. Eddy current loss.
2. Rare earth screens.
3. Galvanometer.
4. Faraday's law.
5. HVT and TVT.
6. Define Artificial Radioactivity.
7. Isotope.
8. Define Space charge effect.
9. X-ray target material.
10. Define Grid Ratio.

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

[AHS 1125] **NOVEMBER 2025** **Sub. Code: 1842**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
FIRST YEAR (Regulation 2018-2019 onwards)
PAPER II – GENERAL PHYSICS, RADIATION PHYSICS &
PHYSICS OF DIAGNOSTIC RADIOLOGY
Q.P. Code: 801842

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : **(3 x 10 = 30)**

1. Explain the production of rotating Anode X-ray tube with neat diagram.
2. Write in detail the uses of Radioactive isotopes in Medicine.
3. Explain in detail the interaction of X-rays with matter.

II. Write Notes on: **(8 x 5 = 40)**

1. Describe about self induction and mutual induction.
2. Explain the various factors affecting the quality and quantity of X-rays.
3. Explain mA control circuit.
4. Construction of intensifying Screens.
5. Natural Radioactivity and Artificial Radioactivity.
6. Construction of nuclear reactor.
7. Beam limiting devices.
8. Explain the properties of X-rays.

III. Short Answers on: **(10 x 3 = 30)**

1. Define Force.
2. Define isotopes.
3. What is thermionic emission?
4. What is heel effect?
5. Define Faradays Law.
6. What is focusing cup?
7. Define electric current & its uses.
8. Electromagnetic Radiation
9. Define work and its unit.
10. Line focus principle.

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