



**GOVERNMENT OF KERALA**  
**DIRECTORATE OF MEDICAL EDUCATION**  
**DIPLOMA IN RADIOLOGICAL TECHNOLOGY REGULAR EXAMINATION (Old and New scheme)**  
**MAY 2023**

Time 3hrs

**Part 1 Paper 1**

**DRT-F-I-MAY 2023**

Max 100 Marks

**GENERAL AND RADIATION PHYSICS**

(Answer Section A & B separately and draw diagrams wherever necessary)

**SECTION-A**

- I. Answer the following** ( 5x3=15)
- a. Atomic Structure
  - b. Semiconductors
  - c. Autotransformer
  - d. Turns Ratio
  - e. AND gate and OR gate
- II. Explain the following** (3x5=15)
- a. Self-rectified X-ray Circuit
  - b. Moving coil galvanometer
  - c. Laws of Electromagnetic Induction
- III. Answer the following** (5+5+10=20)
- a. Law of Radioactive Decay
  - b. The Activity of an Iridium source is 10 Ci. What will be activity of the source after 3 months. Also calculate the mean life of the source ( $T_{1/2} = 74$  days).
  - c. Explain Transient and Secular Equilibrium.

**SECTION B**

- I. Answer the following** (5x3=15)
- a. Effective Dose and Equivalent Dose
  - b. Physics of Thermoluminescence
  - c. Inherent and added filtration
  - d. Linear attenuation coefficient
  - e. Pair Production
- II. Explain the following** (3x5=15)
- a. Photoelectric Effect and its importance in diagnostic radiology
  - b. Three regions of operation of Gas filled detectors
  - c. Bragg peak
- III. Explain** (15+5=20)
- a. What are the major components of an X-ray tube? Explain how X-rays are produced?
  - b. What is the actual focal length of a diagnostic X-ray tube sloped at angle  $17^\circ$  and projected focal length of 2mm?

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DRT-F-II-

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Marks

Part 1 Paper - II

Max 100

**ANATOMY**

(Answer Section A & B separately and draw diagrams wherever necessary)

**SECTION-A**

- I. Essay –  
Enumerate the parts of Respiratory system. Describe Trachea , Left Lung, Bronchopulmonary Segment and Radiological investigations of the system. (3+2+5+3+2=15)
- II. Write briefly on : (4x5=20)
- a. Epithelium
  - b. Prostate
  - c. Femur
  - d. Pituitary gland
- III. Write Short Notes on (5x3=15)
- a. Osteon
  - b. Spinal Cord
  - c. Deltoid Muscle
  - d. Kidney
  - e. Pleura

**SECTION B**

- IV. Essay –  
Enumerate the parts of Digestive System. Describe about stomach, Liver and Radiological investigations of this system (3+5+5+2=15)
- V. Write briefly on (4x5=20)
- a. Cerebellum
  - b. Ovary
  - c. Urinary bladder
  - d. Eye
- VI. Write short notes on (5x3=15)
- a. Male urethra
  - b. Basilic vein
  - c. Cardiac Muscle
  - d. Aorta
  - e. Spleen

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**Part 1 Paper III  
PHYSIOLOGY AND PATHOLOGY  
SECTION A**

(Answer Section A & B separately and draw diagrams wherever necessary)

- I.** Write the composition, functions and regulation of salivary secretion. Add a note on conditioned and unconditioned salivary secretion (10+5=15)
- II. Write the normal value of:-** (5x2= 10)
- a) RBC count in adults
  - b) Blood Urea
  - c) Serum Bilirubin
  - d) Blood glucose level
  - e) Duration of cardiac cycle
- III. Write short notes on** (5x2=10)
- a. Surfactant
  - b. Actions of thyroxine
  - c. Dialysis
  - d. Functions of lymph
  - e. Neuromuscular junction
- IV. Name the following** (10x1=10)
- a. Name the condition in which oxygen supply to the tissue is reduced.
  - b. Name the pacemaker of human heart
  - c. Name the tract carrying pressure sensation from limbs
  - d. Name two hormones released from ovary
  - e. Name the receptor for colour vision
  - f. Name the smooth muscle in urinary bladder
  - g. Name the hormone that reduces blood glucose level.
  - h. Name the functional unit of a kidney
  - i. Name one method of contraception
  - j. Name the secretion from Leydig cells of testis
- V. Describe** (1x5=5)
- a. Visual pathway and its lesions

P.T.O

## SECTION B

1. Define Anemia. How do you classify Anemia. Write briefly on aetiology, blood picture and other laboratory findings in Iron deficiency anemia. (1+3+6=10)

**II. Write short notes on:** (5x5=25)

- a) Osteomyelitis
- b) Tuberculosis
- c) Chronic Venous congestion
- d) Hepatitis
- e) Beri beri

**III. Define the following** (5x2=10)

- a. Hyperplasia
- b. Leukemia
- c. PCV
- d. Necrosis
- e. Inflammation

**IV. Name the following:-** (5x1=5)

- a) Two causes of Eosinophilia
- b) Name different types of gangrene
- c) Name two bone tumours
- d) Two chemical mediators of inflammation
- e) Two factors affecting wound healing

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**Part II Paper I**

Max 100 Marks

**PHYSICS OF MEDICAL IMAGING AND RADIATION SAFETY IN RADIODIAGNOSIS**

(Answer Section A & B separately and draw diagrams wherever necessary)

**SECTION A**

- I. Explain the following (5x4=20)
- |                 |                    |
|-----------------|--------------------|
| a. Latent image | b. Optical density |
| c. Penumbra     | d. AEC             |
| e. OPG          |                    |
- II. Briefly explain the following (3x5=15)
- a. T1 & T2 Relaxation time  
b. Isotopes used in Nuclear Medicine  
c. Interaction of Ultrasound waves.
- III. a. Describe the principle of Computed Tomography and Explain the different CT Generations in detail (1x15=15)

**SECTION B**

- IV. Explain the following (5x3=15)
- |                                 |                                 |
|---------------------------------|---------------------------------|
| a. Quality of X-Rays            | b. Mass attenuation coefficient |
| c. Natural background radiation | d. LD <sub>50/60</sub>          |
| e. ALARA                        |                                 |
- V. Write short note on (3x5=15)
- a. Role of Technologist in Radiology Department  
b. Philosophy of Radiation Protection  
c. Scintillation Detectors
- VI. Explain the following (2x10=20)
- a. Explain interaction of charged particles and Neutrons with matter
- b. Explain Radiation safety consideration in Conventional Radiography and Digital Radiography.
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**DRT-S-II-MAY-2023**

Time 3hrs

**Part II paper II**

Max 100 Marks

**RADIOGRAPHY TECHNIQUES**

(Answer Section A & B separately and draw diagrams wherever necessary)

**SECTION A**

- I. Radiography of paranasal sinuses. Briefly describe different views (20)
- II. Write Short Notes on (5x6=30)
- a. 10 day rule of pregnancy
  - b. Safe light
  - c. PACS in radiography
  - d. Radiography of forearm
  - e. Stryker's View

**SECTION B**

- I. Explain in detail about components of the X-Ray tube (20)
- II. Write Short Notes on (6x5=30)
- a. Ball Catcher's view
  - b. Structure of an X-Ray film
  - c. Sialography
  - d. Complications of IV Contrast
  - e. Grid
  - f. Reid's Baseline

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Time 3hrs

**Part-II Paper-III**

Max 100 Marks

**ADVANCED MEDICAL IMAGING TECHNOLOGY**

(Answer Section A & B separately and draw diagrams wherever necessary)

**SECTION A**

- I. Describe about Direct Digital Radiography System and its advances (15)
- II. Write Short Notes on: (6x5=30)
- a. Mammography
  - b. Transducer
  - c. CT cisternogram
  - d. Dual energy CT
  - e. CT artefacts
  - f. CT contrast medium
- I. Expand the following (5x1=5)
- a. MSCT
  - b. CR
  - c. HRCT
  - d. MPR
  - e. TOF

**SECTION -B**

- I. Explain about different fusion imaging and its advantages (15)
- II. Write short notes on: (7x5=35)
- a. PET
  - b. MRCP
  - c. PCN
  - d. FNAC
  - e. RF Ablation
  - f. Gamma Camera
  - g. MR safety

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Max 100 Marks

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Max 100 Marks

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