

**MANIPAL UNIVERSITY**  
**SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2014**  
**SUBJECT: RADIATION PHYSICS**  
**(2011 SCHEME)**

Monday, June 16, 2014

Time: 10:00-13:00 Hrs.

Max. Marks: 80

1. **Answer ALL the questions:**

- 1A. What are electromagnetic radiations? Mention their properties.
- 1B. Define specific ionization, linear energy transfer and range.
- 1C. Define half life. Derive an expression for the same. The half-life of  $^{99m}\text{Tc}$  is 6.0 hours and that of  $^{113m}\text{In}$  is 1.7 hours. How much time must elapse before a 100-GBq sample of  $^{113m}\text{In}$  and a 20-GBq sample of  $^{99m}\text{Tc}$  possess equal activities?
- 1D. Write about annihilation and pair production.
- 1E. Explain briefly about photomultiplier tube.
- 1F. What is filtration? Write about different types of filters and also mention the recommended total filtration for diagnostic radiology.

(5 marks  $\times$  6 = 30 marks)

2. **Answer any FIVE of the following questions:**

- 2A. Write in detail about Bohr's atom model.
- 2B. Describe in detail the construction and working of an X-ray tube with a schematic diagram. Also mention the advantage of rotating anode x-ray tube over stationary anode x-ray tube.
- 2C. What are the different modes of decay? Explain each mode with example.
- 2D. Derive the general equation for law of successive disintegration and explain transient equilibrium.
- 2E. Write short notes on:
  - i) Scintillation detectors
  - ii) Thermo luminescence detectors
- 2F. Write in detail about neutron interaction with matter.

(10 marks  $\times$  5 = 50 marks)



Reg. No.																			
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

## MANIPAL UNIVERSITY

SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2014

SUBJECT: PRINCIPLES AND PRACTICE OF RADIOTHERAPY: PART – I  
(2011 SCHEME)

Wednesday, June 18, 2014

Time: 10:00-13:00 Hrs.

Max. Marks: 80

---

1. Answer any FIVE questions from the following:

- 1A. What are the steps to be taken in CT acquisition of a patient for radiotherapy planning?
- 1B. Describe the rationale for fractionation in radiotherapy.
- 1C. How cancer is commonly staged? Describe the staging system.
- 1D. What is meant by acute radiation sickness? Describe the consequences of a single whole body radiation exposure of 14 Gy.
- 1E. What is the rationale for combining multiple treatment options in cancer treatment? Describe in brief on neoadjuvant and adjuvant therapies.
- 1F. Write briefly on common causes of death in a patient with cancer.

(10 marks × 5 = 50 marks)

2. Answer ALL questions from the following:

- 2A. Radiation induced spinal cord damage
- 2B. Medical treatment options for cancer pain
- 2C. Common symptoms of cancer
- 2D. Radiosensitivity and radiocurability
- 2E. 4 Rs of radiobiology
- 2F. Describe the different types of brachytherapy.

(5 marks × 6 = 30 marks)



Reg. No.									
----------	--	--	--	--	--	--	--	--	--

MANIPAL UNIVERSITY  
SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2014  
SUBJECT: PRINCIPLES AND PRACTICE OF RADIOLOGY  
(2011 SCHEME)

Friday, June 20, 2014

Time: 10:00-13:00 Hrs.

Max. Marks: 80

1. Answer any FIVE questions from the following:

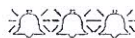
- 1A. Outline the construction and working principle of an X-ray tube.
- 1B. Explain about the characteristics of an Image.
- 1C. What do you mean by silver recovery? Explain about the methods used for it.
- 1D. Explain the positioning and basic views for Vertebral column.
- 1E. Write in detail about Digital Subtraction Angiography.
- 1F. Mention the causes and remedies for CT Artefacts.

(10 marks × 5 = 50 marks)

2. Answer ALL questions.

- 2A. Discuss about the construction of an Intensifying screen.
- 2B. Explicate the factors affecting development and fixing of radiographic film.
- 2C. Discuss about the various types of X-ray film.
- 2D. Describe about the various uses of characteristic curve.
- 2E. Write the positioning and basic views for skull.
- 2F. Compare Manual and Automatic film processing.

(5 marks × 6 = 30 marks)



Reg. No.									
----------	--	--	--	--	--	--	--	--	--

**MANIPAL UNIVERSITY**  
**SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2014**  
**SUBJECT:A: HOSPITAL PRACTICE AND PATIENT CARE**  
**B: RECORD KEEPING**  
**(2011 SCHEME)**

Wednesday, June 25, 2014

Time: 10:00-13:00 Hrs.

Max. Marks: 80

**SECTION – A : HOSPITAL PRACTICE AND PATIENT CARE (40 MARKS)**

1. Answer any FOUR of the following questions:

- 1A. What is the role of radiotherapy and surgery in the management of bone metastases?
- 1B. Write briefly on universal precautions.
- 1C. What information has to be given to a patient who is being planned for curative radiotherapy for cancer of the cervix?
- 1D. What is meant by proteins? What is their importance?
- 1E. Enumerate the different types of bowel diversions, and explain in brief about them.

(10 marks × 4 = 40 marks)

**SECTION – B : RECORD KEEPING (40 MARKS)**

2. Answer any FOUR of the following questions:

- 2A. Define analysis of Medical records.
- 2B. Mention four important personalities in history of medicine and their contribution.
- 2C. Write a short note on confidentiality of Medical records.

(2+4+4 = 10 marks)

- 3A. Write merits and demerits of middle digit filing system.
- 3B. Write the various rules involved in FORM designing.

(5+5 = 10 marks)

- 4A. Write format of history and Physical examination FORM.
- 4B. What is the policy in retention of Medical records such as OP records, IP records and records of medico-legal cases?

(4+6 = 10 marks)

- 5A. Name important text books in Ayurveda medicine, their authors and its significance in history of medicine.
- 5B. Explain briefly Medical records found in primitive Egyptian medicine.

(5+5 = 10 marks)

- 6A. Mention the need for computerization of Medical records.
- 6B. What are the values of Medical records for patient?

(5+5 = 10 marks)



Reg. No.																			
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**MANIPAL UNIVERSITY**  
**SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2014**  
**SUBJECT: GENERAL AND APPLIED PATHOLOGY**  
**(2011 SCHEME)**

Friday, June 27, 2014

Time: 10:00-11:30 Hrs.

Max. Marks: 40

☞ **Answer ALL questions:**

1. Define anaemia. Describe the aetiology and laboratory diagnosis of nutritional anaemias.  
(1+3+4 = 8 marks)
2. Define necrosis. Describe the different types of necrosis with examples.  
(1+6 = 7 marks)
3. **Write short notes on:**
  - 3A. Aetiology of tumours with examples
  - 3B. Renal edema
  - 3C. Differences between tuberculoid and lepromatous leprosy
  - 3D. Fate of thrombus
  - 3E. Hyperplasia and metaplasia with examples(5 marks × 5 = 25 marks)

