MANIPAL UNIVERSITY

SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: RADIATION PHYSICS: PART – I

Monday, June 06, 2011

Time: 14:00-17:00 Hrs.   Max. Marks: 80

1.   **Answer all the questions.**

1A. Define Specific activity and derive an expression for the same.

1B. Write a short note on semiconductor detectors.

1C. Write briefly about charged particle interaction with matter.

1D. i)   If a radioactive nuclide decays for an interval of time equal to its average life, what fraction of the original activity remains?

     ii)   What are the frequency and wavelength of a 100-keV photon?

1E. Write briefly about effect of filters on patient exposures.

1F. Write a short note on liquid scintillation detector.

(5×6 = 30 marks)

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

2A. Write in detail about hooded anode therapy tube with a neat labeled diagram.

2B. What are the different modes of decay? Explain each mode with example.

2C. Draw the V-I characteristics curve of gas filled detectors and explain each region in detail.

2D. Write in detail about neutron interaction with matter.

2E. Derive the general equation for law of successive disintegration and explain transient equilibrium.

2F. Write in detail about attenuation coefficients and the factors affecting attenuation.

(10×5 = 50 marks)

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: PRINCIPLES AND PRACTICE OF RADIOTHERAPY: PART – I

Wednesday, June 08, 2011

Time: 14:00-17:00 Hrs.   Max. Marks: 80

PART – A

1.   **Answer any FIVE questions from the following:**

1A.   What are the common cancers that are associated with bone metastasis? Write the common complications of bone metastasis. Outline the management of bone metastasis.

1B.   What are the effects of cancer on the patient? Write briefly on cancer cachexia syndrome.

1C.   Write in brief on radiosensitivity and radiocurability, and on factors affecting them.

1D.   What is acute radiation syndrome? Enumerate the Acute radiation syndromes, and write in brief on any one of them.

1E.   Write the steps involved in the radiotherapy planning for a patient with cancer.

1F.   What are the factors affecting early and late reactions? Write on the late effects of radiation on spinal cord.

(10×5 = 50 marks)

PART – B

2.   **Answer all questions from the following:**

2A.   WHO step ladder in pain management.

2B.   4 Rs of radiobiology.

2C.   Hypo fractionation.

2D.   What is the importance of staging in cancer?

2E.   Write the disadvantages and advantages of brachytherapy.

2F.   TD 5/5 and TD 50/5

(5×6 = 30 marks)

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: PRINCIPLES AND PRACTICE OF RADIOLOGY

Friday, June 10, 2011

Time: 14:00-15:30 Hrs.   Max. Marks: 40

✍ **Answer any FOUR.**

✍ **Each question carries 10 marks.**

1. Construction of X-ray film.

2. Grid controlled X- ray tube.

3. Hand AP, Lateral and Oblique views.

4. Permanent magnets in MRI.

5. CT artiifacts.

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: RADIATION PROTECTION, STANDARDS AND REGULATIONS

Monday, June 13, 2011

Time: 14:00-15:30 Hrs.   Max. Marks: 40

✍ **Answer any FOUR of the following questions.**

1A. Write short note on stochastic effect and deterministic effect.

1B. What are dose limits for radiation worker and general public?

(5+5 = 10 marks)

2A. What are the basic guidelines for disposal of radioactive waste? Explain each with an example.

2B. Discuss about the effects of radiation on cell.

(5+5 = 10 marks)

3A. Define HVL and TVL. How many HVLs make one TVL? Where does one use this concept in radiation protection? The exposure rate from a Cs-137 source at a point is 100 mR/h. How much lead should be interposed between the source and the point so that exposure level could be brought down to 0.25 mR/h at this place? (HVL of Pb = 0.6 cm)

3B. Write briefly about the planning of a diagnostic X-ray room with a typical room layout.

(5+5 = 10 marks)

4. Write in detail about safety features and work practices in beam therapy in terms of planning as well as equipment.

(10 marks)

5. **Define:**

5A. Exposure

5B. KERMA

5C. Absorbed dose

5D. Equivalent dose

5E. Effective dose.

(2×5 = 10 marks)

MANIPAL UNIVERSITY

SECOND YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2011

SUBJECT: A: HOSPITAL PRACTICE AND PATIENT CARE
B: RECORD KEEPING

Wednesday, June 15, 2011

Time: 14:00-17:00 Hrs.   Max. Marks: 80

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

✍ **Answer any FOUR of the following questions.**

1. Describe the calorific division of nutrients as should be maintained for cancer patients during treatment.

2. List the precautions to be taken to safeguard yourself when dealing with a HIV positive patient with an open infected wound.

3. Write on the potential complications of urinary diversion. Discuss about postoperative stoma care.

4. What are the problems associated with spread of cancer to bone? List the common cancers that spread to the bone.

5. Enumerate the care to be taken in the transporting of a non-ambulant patient.

(10×4 = 40 marks)

SECTION – B : RECORD KEEPING (40 Marks)

✍ **Answer any FOUR of the following questions.**

6A. Define medical record.
6B. Mention four important personalities in history of medicine and their contribution.
6C. What are the purposes of maintaining medical records?

(2+4+4 = 10 marks)

7A. Explain briefly about medical records found in Primitive Egyptian Medicine.
7B. Mention the values of medical records for international health agencies.

(5+5 = 10 marks)

8A. Write a short note on middle digit filing system.
8B. Write few tips in developing new forms in medical record department.

(4+6 = 10 marks)

9A. Write the format of admission request form.
9B. Mention the advantages of problem oriented medical record.

(6+4 = 10 marks)

10A. What is an index?
10B. Mention the types of index.
10C. What are the purposes of those indexes?

(3+3+4 = 10 marks)

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Page 1 of 1