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MANIPAL UNIVERSITY

MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2012

SUBJECT: PAPER I: BASIC SCIENCES IN RELATION TO RADIOTHERAPY

Monday, April 02, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

1. What are the four R's of Radiobiology and describe its importance in fraction of Radiotherapy.
(20 marks)
2. Discuss the anatomy of skin and response of skin to irradiation.
(20 marks)
3. Discuss the various therapeutic approaches, dose and fractionation involved in nasopharyngeal carcinoma with reference to recent advances in the management of nasopharyngeal carcinoma.
(20 marks)
4. **Write short notes on:**
 - 4A. Late effects of radiation
 - 4B. Rhabdomyosarcoma
 - 4C. Oxygen enhancement ratio
 - 4D. Potential Doubling time and significance

(10×4 = 40 marks)



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MANIPAL UNIVERSITY

MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2012

SUBJECT: PAPER II: PHYSICS, NUCLEAR MEDICINE AND STATISTICS

Tuesday, April 03, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

Answer ALL the questions.

1. Describe typical linear accelerator and set up of linear accelerator.
(20 marks)
2. Describe the physiology of pain and management of pain in cancer.
(20 marks)
3. What is Percent Depth Dose? Discuss the factors affecting it and its clinical importance in treatment planning.
(20 marks)
4. **Write short notes on:**
 - 4A. Chi square test
 - 4B. Mediastinal tumors
 - 4C. Strontium 89
 - 4D. Adenocarcinoma of cervix

(10×4 = 40 marks)



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MANIPAL UNIVERSITY

MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2012

SUBJECT: PAPER III: CLINICAL RADIOTHERAPY AND CANCER CHEMOTHERAPY

Wednesday, April 04, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions.

1. Describe the clinical features, staging and recent advances in the management of early breast cancer.

(20 marks)

2. Discuss the anatomy and orbit and discuss the tumours that arise in orbit. How do you manage orbital rhabdomyosarcoma?

(20 marks)

3. Discuss the management of carcinoma rectum.

(20 marks)

4. **Write short notes on:**

4A. Proton beam therapy

4B. TLD badges

4C. Radiotherapy after hip replacement surgery

4D. Oncocytoma

(10×4 = 40 marks)



MANIPAL UNIVERSITY**MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2012****SUBJECT: PAPER IV: RECENT ADVANCES IN RADIATION ONCOLOGY**

Thursday, April 05, 2012

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

1. Describe the CSF pathway. Enumerate the tumours that spread through the craniospinal fluid pathway. Describe the management of medulloblastoma in a child of 10 years.
(20 marks)
2. Enumerate the differences between LDR and HDR Brachytherapy. Discuss the radiobiological rationale of HDR Brachytherapy.
(20 marks)
3. Discuss the Quality assurance for Conformal Radiotherapy and steps involved.
(20 marks)
4. **Write short notes on:**
 - 4A. Proton therapy
 - 4B. Cytokines and their clinical significance
 - 4C. CT simulator for planning
 - 4D. Paraplegia due to malignancy

(10×4 = 40 marks)

