MANIPAL ACADEMY OF HIGHER EDUCATION
MD (RADIOTHERAPY) DEGREE EXAMINATION – JULY 2023
PAPER I

Monday, July 03, 2023

Time: 14:00 – 17:00 Hrs.   Max. Marks: 100

✍ **Answer ALL questions.**

1. Write in brief on the anatomy and lymphatic drainage of the rectum. How will you evaluate a patient with adenocarcinoma rectum prior to further treatment planning?

2. How are early and late responding normal tissues radiobiologically different? Explain how fractionation can be used to ameliorate damage to late responding tissues?

3. Explain the underlying principle and uses of a thimble ion chamber. Describe with diagram the design of a thimble ion chamber.

4. What is meant by the ALARA principle? Explain the principle and benefits of the Last-Man-Out switch in enhancing the safety of radiation personnel.

5. What are the consequences of ionizing radiation on female fertility? Write briefly on use of radiation for ovarian ablation.

6. Write in brief on the role of predictive assays in radiotherapy.

7. What is meant by surface mould brachytherapy, and how is it delivered? When will you choose surface mould brachytherapy over electron beam radiotherapy?

8. Write on the pathological classification of bone tumors.

9. What is the importance of quality assurance in radiotherapy? What are the recommended daily QA tests to be undertaken prior to clinical utilization of a linear accelerator?

10. Write on the staging system used for staging non-small cell lung cancer.

(10 marks × 10 = 100 marks)

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PAPER II

Tuesday, July 04, 2023

Time: 14:00 – 17:00 Hrs.   Max. Marks: 100

✍ **Answer ALL questions.**

1. Write upon the use of definitive radiotherapy for a patient with atypical meningioma at the base of skull.

2. When will you consider the use of adjuvant vaginal brachytherapy in a patient with stage I endometrial cancer? Write briefly on the technique.

3. A 55 year old lady with recent diagnosis of myasthenia gravis, has been found to have an anterior mediastinal mass. How will you evaluate this patient? What is the role of radiotherapy in its management?

4. A well-preserved 65 year old man with adenocarcinoma lung with incidentally detected multiple brain metastases on metastatic evaluation has been referred for radiotherapy. How will you manage him?

5. When will you consider to treat internal mammary lymph nodes in a patient with breast cancer? Compare the different techniques of IMN radiation.

6. How will you treat a 50 year old patient with carcinoma of the post-cricoid, clinically staged as T2N0M0?

7. Write on the strategies that could be employed for reducing the risk of developing severe acute dermatitis in a patient requiring pelvic radiotherapy.

8. What are the recommended radiotherapy dose constraints for the spinal cord? Write on the symptoms and management of radiation myelopathy.

9. Describe the role of radiotherapy in the management of Ewing's sarcoma.

10. Write briefly on bladder preservation strategy with radiotherapy for muscle invasive bladder cancers.

(10 marks × 10 = 100 marks)

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PAPER III
Wednesday, July 05, 2023

Time: 14:00 – 17:00 Hrs.   Max. Marks: 100

✍ **Answer ALL questions.**

1. What are the factors that need to be taken into consideration in planning treatment for a patient with neuroblastoma?

2. How is pain measured? How will you manage a patient with locally advanced oral cancer in moderately severe pain?

3. What are the advantages and disadvantages of neoadjuvant chemotherapy in head and neck squamous cancers? Write on the different regimens that are routinely used on neoadjuvant chemotherapy in head and neck cancers.

4. How will you evaluate a patient on chemotherapy for locally advanced breast cancer, with new onset delirium?

5. Classify the tumors of endometrium. What are the indications for adjuvant chemotherapy in a patient with endometrial cancer?

6. A 60 year old chronic smoker has come to the casualty with subacute onset of facial puffiness and mild difficulty in breathing of two weeks' duration. How will you evaluate this patient?

7. Write in brief on the role of prophylactic cranial radiotherapy in acute leukaemias.

8. Outline the management of a 25 year old female patient diagnosed with low risk stage IIA classical Hodgkin's Lymphoma- mixed cellularity.

9. How will you evaluate and manage a 14 year old boy who has presented to the clinic with a progressive swelling in the lower end of the thigh of two months' duration?

10. Outline the management of a patient with anaplastic thyroid cancer.

(10 marks × 10 = 100 marks)

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PAPER IV

Thursday, July 06, 2023

Time: 14:00 – 17:00 Hrs.   Max. Marks: 100

✍ **Answer ALL the questions.**

1.   Differentiate between systematic and random set-up errors. What are the potential benefits, and disadvantages of a 6 Degree-of-freedom couch when buying a linear accelerator?

2.   Elaborate on the role of durvalumab in the management of non-small cell lung cancer. What are the toxicities encountered with Durvalumab?

3.   What are the indications for sentinel lymph node biopsy? How is it performed?

4.   What are the different types of metanalysis? How is a metanalysis reported?

5.   Write in brief the role of radiotherapy in the management of heterotopic ossification.

6.   When will you consider the use of stereotactic radiotherapy in management of a patient with brain metastases? What are the pre-requisites for effective delivery of SRT?

7.   Write on the target volumes described by the ICRU-89, and the recommended target doses.

8.   What is meant by cancer screening? What are the underlying principles, and pre-requisites for cancer screening?

9.   What is the rationale for hypofractionated radiotherapy in prostate cancer? When will you choose a patient with prostate cancer for hypofractionated radiotherapy schedules?

10. What are the benefits of a proton beam radiotherapy? Draw a schematic diagram of a proton therapy unit.

(10 marks × 10 = 100 marks)