

MANIPAL ACADEMY OF HIGHER EDUCATION
MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2022

PAPER I

Friday, April 01, 2022

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

1. Write in brief on the anatomy of the liver. How will you evaluate a patient with suspected hepatocellular carcinoma?
2. What is meant by EQD2? Write briefly with an example on how it is used in the clinic.
3. What are the different methods of personnel monitoring for radiotherapy exposure? Write about any one in brief.
4. What is an ideal brachytherapy source? Compare Cobalt-60 and Iridium-192 as potential High Dose Rate brachytherapy sources.
5. What are the different techniques that have been explored in predicting radiosensitivity? Write any one in detail.
6. What is the importance of a beam flattening filter? Write the advantages and disadvantages of a flattening-filter-free photon beam.
7. Explain the mechanism by which fractionation enhances therapeutic ratio in radiotherapy.
8. What is meant by SAD and SSD techniques of external beam radiation delivery? When will you consider SSD technique over SAD technique for radiotherapy?
9. What are the optimum features that need to be reported in a post-operative gross pathological specimen following breast conservation surgery?
10. What is meant by stochastic effect of radiotherapy? Write any one stochastic effect in detail.

(10 marks × 10 = 100 marks)



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PAPER II

Saturday, April 02, 2022

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

1. How will you treat a 30 year old patient with carcinoma of the right lateral border of the tongue, clinically staged as T2N0M0, who is unwilling to undergo surgery?
2. Write upon the Radiotherapy and Oncology Group consensus guidelines on volume delineation for gliomas.
3. What are the different techniques of delivering Total Body Irradiation? What are the toxicities commonly experienced in a patient undergoing TBI?
4. Compare and contrast the different techniques of radiotherapy that can be considered for a 70 year old patient with basal cell carcinoma of the malar region.
5. A patient with hormone refractory prostate cancer has come with progressive low back ache of 2 weeks' duration. How will you further evaluate him? When will you prefer single fraction schedule over multifractionated palliative radiotherapy schedules?
6. Write in brief the various techniques of executing a craniospinal irradiation.
7. How will you treat a 50 year old well-preserved lady with squamous cell carcinoma of the middle third esophagus, clinically staged as T4N0M0?
8. What are the deterministic consequences of radiotherapy exposure to the heart?
9. What is the purpose of templates in brachytherapy? Write in detail the design of any one template used in pelvic brachytherapy.
10. Write briefly on elective para-aortic node radiotherapy in carcinoma cervix.

(10 marks × 10 = 100 marks)



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PAPER III

Monday, April 04, 2022

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

1. What are the risk factors for development of Wilms' tumor? How is Wilms tumor staged, and what are the important pathological prognostic factors?
2. What are the different types of pain? Write in brief on the management of neuropathic pain.
3. Compare the rationale, advantages and disadvantages of neoadjuvant, concurrent and adjuvant chemotherapy along with radiotherapy.
4. How will you manage a patient with breast cancer, who has presented to the clinic with one day history of mild fever, and no other symptoms, following the 1st course of AC chemotherapy that she received 10 days ago?
5. What are the different treatment options for a 30 year old man who has been diagnosed to have stage I seminoma, following high inguinal orchidectomy?
6. A patient with refractory ovarian carcinoma has reported to the clinic with gross abdominal distention secondary to ascites. What are the possible strategies that could be considered for relieving her symptoms?
7. Write in brief on the role of prophylactic cranial radiotherapy in lung cancer.
8. How will you manage a 25 year old male patient with recently diagnosed stage IA nodular Lymphocyte Predominant Hodgkin's Lymphoma?
9. Outline in brief the management of a 15 year old girl with non-metastatic Ewing's sarcoma of the sacral region.
10. Elaborate on the bladder preservation strategies that could be considered for a patient with muscle invasive bladder cancer.

(10 marks × 10 = 100 marks)



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PAPER IV

Tuesday, April 05, 2022

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

1. What is meant by adaptive radiotherapy? What are the different types of adaptations that could be considered in developing an adaptive radiotherapy protocol?
2. What is the rationale for immunotherapy? What are the toxicities encountered in immunotherapy?
3. How will you differentiate pseudo-progression from a true progression in a patient with high grade glioma on follow-up?
4. What are the differences between parametric and non-parametric tests? Write in brief on chi-squared test.
5. Write in brief the role of radiotherapy in the management of keloids.
6. When will you consider the use of stereotactic radiotherapy in management of a patient with localized non-small cell carcinoma lung? What are the possible toxicities of SBRT in this patient?
7. When will you consider the utilization of interstitial implantation brachytherapy in a patient with cervical cancer? Write in brief on the Vienna applicator for use in gynaecological cancers.
8. What will you recommend a lady requesting for screening for cervical cancer?
9. What is the rationale for hypofractionated whole breast radiotherapy? What are the different schedules that could be considered?
10. Describe the design of a tomotherapy unit. What are the potential benefits and disadvantages of a tomotherapy unit?

(10 marks × 10 = 100 marks)

