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MANIPAL UNIVERSITY

MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2017

SUBJECT: PAPER I: BASIC SCIENCES, RADIOLOGY, STATISTICS, NUCLEAR MEDICINE

Monday, April 03, 2017

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Discuss the lymphatic drainage of the Breast. Outline the Management (Investigations and Treatment) for a 53 year old post-menopausal female with cT3N1M0 Infiltrating Ductal Carcinoma of the Right Breast “Luminal B subtype” Her 2 Neu Positive.

(15 marks)

2. Describe the Physiology of Pain Pathway. Elaborate on the WHO Pain Ladder for cancer pain.

(15 marks)

3. **Write short notes on:**

3A. RBE (Relative Biological Effectiveness)

3B. RE-ASSORTMENT and RE-POPULATION in radiobiology

3C. Ca. Parotid: Anatomy+ Lymphatic Drainage, Indications of Post Op RT

3D. Rationale for Difference in Clinical Response of Testes and Ovary to Radiotherapy

3E. Postoperative radioiodine ablation for Ca. Thyroid: Indications, Post Therapy Precautions & Complications.

3F. Radiotherapy Induced Nausea Vomiting: Risk Stratification & Management

3G. Forest plot (or Blobbogram)

3H. Hazard Ratio

3I. Describe the breast imaging-reporting and data system (BIRADS)

3J. Samarium 153 in Bone metastases: Rationale, Advantage Contraindications

(7 marks × 10 = 70 marks)



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MANIPAL UNIVERSITY

MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2017

SUBJECT: PAPER II: RADIATION PHYSICS, RADIOTHERAPY

Tuesday, April 04, 2017

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

✍ **Long Essay:**

1. Discuss the role of radiotherapy in early breast cancer. (15 marks)
2. Discuss the effect of tissue inhomogeneties in radiation dose distribution. (15 marks)

3. **Short Notes:**

- 3A. ICRU 50
- 3B. Paget's disease of the nipple
- 3C. Gap correction factor
- 3D. Integral dose
- 3E. Tissue compensators
- 3F. Total body irradiation
- 3G. Inverse square law
- 3H. Au-198
- 3I. Role of radiotherapy in soft tissue sarcoma
- 3J. Orbital lymphoma

(7 marks × 10 = 70 marks)



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MANIPAL UNIVERSITY

MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2017

SUBJECT: PAPER III: CHEMOTHERAPY, CLINICAL ONCOLOGY

Wednesday, April 05, 2017

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Staging of CA ovary and management of stage IIIC ovarian cancer. (15 marks)
2. Paraneoplastic syndromes. (15 marks)

3. **Short Notes:**

- 3A. Filgrastim
- 3B. Advantages and disadvantages of concurrent chemo-RT
- 3C. IL-2
- 3D. Management of NSCLS T2N1M0 (stage IIB) with R1 resection
- 3E. Erythroplakia
- 3F. S phase fraction
- 3G. Temozolomide
- 3H. Erlotinib
- 3I. P 32
- 3J. Therapeutic index

(7 marks × 10 = 70 marks)



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MANIPAL UNIVERSITY

MD (RADIOTHERAPY) DEGREE EXAMINATION – APRIL 2017

SUBJECT: PAPER IV: RECENT ADVANCES

Thursday, April 06, 2017

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Discuss the motion tracking modalities used in IGRT. (15 marks)
2. Discuss the management of node positive non luminal locally advanced breast cancer. (15 marks)

3. **Short Notes:**

- 3A. Klystron
- 3B. Intra operative radiotherapy
- 3C. Sunitinib
- 3D. Sezary cells
- 3E. IFRT
- 3F. Endovascular brachytherapy
- 3G. Role of concurrent chemotherapy in radiation carcinoma cervix
- 3H. Tyrosine kinase inhibitors
- 3I. Tumour supressor genes
- 3J. Oxygen enhancement ratio

(7 marks × 10 = 70 marks)

