

April-2001

[KD 153]

Sub. Code : 2050

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch IX — Radiotherapy

Part II — Final

**Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY**

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

1. Define the terms SOMA, LENT, TD 5/5 & TD 50/5. What are the limitations of the latter? What are the tolerance doses and describe the clinical syndromes, pathophysiology and management of the late effects of the major dose limiting organs. (25)
2. Describe the physical characteristics of electron beams. Discuss its clinical applications? (25)
3. Write briefly on : (5 × 10 = 50)
 - (a) Frozen section
 - (b) Oxygen effect
 - (c) Prospective trial
 - (d) Tumor markers
 - (e) Dose specifications in intracavitary brachytherapy.

[KE 153]

Sub. Code : 2050

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch IX — Radiationtherapy

Part II — Final

**Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY**

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

1. Discuss the 5R's of radiobiology. Mention the various means of enhancing radiation sensitivity. Discuss the use of radiation sensitizers in clinical practice. (25)
2. Discuss the properties of the various brachytherapy sources commonly used in clinical practice. What are the clinical application of Ir^{192} . Discuss use of templates. (25)
3. Write briefly on ; (5 × 10 = 50)
 - (a) Intensity modulated radiation therapy.
 - (b) TLD.
 - (c) Dose rate effect.
 - (d) LET.
 - (e) Hyperthermia.

March-2002

[KG 153]

Sub. Code : 2050

M.D. DEGREE EXAMINATION

(Revised Regulations)

Branch IX — Radiationtherapy

Part II — Final

**Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY**

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

1. Discuss the mechanisms of radiation cell killing. Explain the radiobiological basis of early and late normal tissue reactions. What is dose rate effect? (25)
2. Discuss the altered fractionation schedules used in clinical practice. Explain the rationale of combining radiation with chemotherapy. What are the clinical applications of chemoradiation? (25)
3. Write briefly on : (5 × 10 = 50)
 - (a) Photodynamic therapy.
 - (b) Intraoperative radiationtherapy.
 - (c) Tc^{99m} scan.
 - (d) Particle therapy
 - (e) Radiation Surveymeter.

[KH 153]

Sub. Code / 2050

M.D. DEGREE EXAMINATION

(Revised Regulations)

Branch IX — Radiotherapy

Part II — Final

Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

1. Describe briefly the interaction of radiation with matter (Photo Electric and Compton Processes, Pair Production). Add a note on attenuation co-efficients. (25)
 2. Describe beam modification devices. Mention briefly about multileaf collimator and dynamic wedges. (25)
 3. Write briefly on : (5 × 10 = 50)
 - (a) Thermo luminiscent Dosimeter
 - (b) Maximum permissible doses.
 - (c) Gamma Camera.
 - (d) The 4 R's of Radiobiology.
 - (e) Hyperthermia.
-

[KI 153]

Sub. Code : 2050

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch IX — Radio Therapy

Part II — Final

Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

1. Discuss the rationale of combining irradiation with surgery. How will you manage a case of carcinoma of Larynx T₂N₀, M₀? (25)
 2. Write an essay on radiation protection in a radiotherapy department. Outline "safe work practice" in your department. (25)
 3. Write short notes on : (5 × 10 = 50)
 - (a) Radio immuno globulins in cancer treatment
 - (b) Midline granuloma
 - (c) Oxygen effect
 - (d) Stereotactic radiosurgery
 - (e) Radioprotectors.
-

[KJ 153]

Sub. Code : 2050

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch IX — Radio Therapy

Part II — Final

Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY

Time : Three hours

Maximum : 100 marks

Theory : Two hours and forty
minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

MCQ must be answered **SEPARATELY** on the
Answer Sheet provided as per the instructions on the
first page.

Answer ALL questions.

Draw suitable diagrams wherever necessary.

Essay Questions :

(2 × 15 = 30)

1. What is LENT (Late Effects Normal Tissue)? State the 10 steps LENT diagnosis process. Discuss in detail LENT on central Nervous system.

2. What are mega voltage units? Describe Cobalt-60 teletherapy Unit.

Short notes :

(10 × 5 = 50)

3. (a) Give an account on Dose-fractionation in Radiotherapy.

(b) Write note on Linear-quadratic equation ($\alpha - \beta$ ratio).

(c) Short note on molecular and cellular aspects of Radiobiology.

(d) Write a short note on Altered fractionation schedule.

(e) What are 'strandquist lines'? What is its clinical significance?

(f) Clinical Trials.

(g) What is the rationale for development of chemical modifiers of Radiation?

(h) OER (Oxygen Enhancement Ratio).

(i) Advantage of after loading techniques in Brachytherapy.

(j) Role of radiotherapy simulators.

[KL 153]

Sub. Code : 2050

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch IX — Radiotherapy

Part II — Final

Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY
AND ONCOLOGY

Time : Three hours

Maximum : 100 marks

Theory : Two hours and
forty minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay questions : (2 × 15 = 30)

- (1) Discuss the biological basis of fractionation.
- (2) Give a summary of different radiotherapy machines.

II. Short notes : (10 × 5 = 50)

- (a) D_0 and D_1 .
- (b) LET.

- (c) TNM staging.
- (d) Hyperfractionation.
- (e) OER.
- (f) Simulator.
- (g) Apoptosis.
- (h) Biological basis of hyperthermia.
- (i) Compensators.
- (j) SAD and SSD techniques.

[KM 153]

Sub. Code : 2050

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch IX — Radiotherapy

Part II—Final

**Paper I — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY**

Time : Three hours Maximum : 100 marks

Theory : Two hours and forty minutes	Theory : 80 marks
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M.C.Q. : Twenty minutes M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay : (2 × 15 = 30)

- (1) Discuss the influence of Anaemia in Cancer management. Discuss the role of Erythropoietin.

- (2) Give a diagrammatic representation of cell cycle. Give an example of a cell kinetic method to assess cell cycle time. What is the significance of recruitment? How does it effect the cell cycle?

II. Short notes : (10 × 5 = 50)

- (a) Early and late sequelae of spinal cord irradiation.

- (b) Relationship between high LET Radiations and Oxygen dependence.

- (c) Overall treatment time and its clinical implications.

- (d) Therapeutic index and its clinical importance.

- (e) LENT-SOMA.

- (f) **Clinical applications of Electron beams.**

- (g) **Stage Migration.**

- (h) **Concomitant Boost Radiotherapy.**

- (i) **Boron-neutron capture therapy.**

- (j) **A symmetric Jaws.**

[KO 151]

Sub. Code : 2050

II. Short notes :

(10 × 5 = 50)

M.D. DEGREE EXAMINATION.

Branch IX — Radiotherapy

GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING RADIOBIOLOGY AND ONCOLOGY

Time : Three hours

Maximum : 100 marks

Theory : Two hours and forty minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Long Essays :

(2 × 15 = 30)

(1) What is the Biological basis of fractionation? Which radio biological factor is being targeted in concomitant boost radiation? Give a hypothetical basis for an ideal fractionation schedule.

(2) Discuss the biological basis of combination of surgery and radiotherapy. Write in detail the role of post operative radiation therapy in Head and Neck cancers.

- (a) Merkel cell carcinoma
- (b) Altered fractionation
- (c) Total skin electron irradiation
- (d) Potential doubling time
- (e) The oxygen effect
- (f) Tumor control probability
- (g) Relative biologic efficiency
- (h) Tumor suppressor genes
- (i) Multi leaf collimation
- (j) Asymmetric collimator jaws.

[KP 151]

Sub. Code : 2050

M.D. DEGREE EXAMINATION.

Branch IX — Radiotherapy

**Paper II — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIOBIOLOGY AND
ONCOLOGY**

Time : Three hours **Maximum : 100 marks**

Theory : Two hours and forty minutes

M.C.Q. : Twenty minutes **M.C.Q. : 20 marks**

Answer ALL questions.

Draw suitable diagrams wherever necessary.

1. Essay :

(1) Discuss organ preservation in cancer treatment. (20)

(2) Describe physical characteristics of Electron beam. Mention the clinical application. (15)

(3) **Role of imaging in radiotherapy - Discuss.(15)**

II. Short notes : (6 × 5 = 30)

(a) Penumbra

(b) Adjuvant therapy

(c) Stereotactic Radiosurgery

(d) I:25

(e) HDR Brachytherapy

(f) Principles of mould therapy.

[KQ 138]

Sub. Code : 2050

II. Short notes :

(6 × 5 = 30)

M.D. DEGREE EXAMINATION.

Branch IX — Radiotherapy

**GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Common to :

**Part II — Final Paper I — (Old/New/Revised
Regulations)**

(Candidates admitted from 1988–89 onwards)

And

**Paper II — (For candidates admitted from 2004–05
onwards)**

Time : Three hours

Maximum : 100 marks

**Theory : Two hours and
forty minutes**

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay :

- 1. Discuss combined modality treatment for cancer. (20)**
- 2. Discuss, the common oncological emergencies. (15)**
- 3. Describe cellular effects of radiation. (15)**

- (a) Biological modifiers**
 - (b) Neoadjuvant chemotherapy**
 - (c) Accelerated fractionation**
 - (d) TNM staging**
 - (e) Radiation oophorectomy**
 - (f) Hemibody irradiation.**
-

[KR 147]

Sub. Code : 2043

M.D. DEGREE EXAMINATION.

Branch IX — Radiotherapy

**Paper II — GENERAL PRINCIPLES OF
RADIOTHERAPY INCLUDING RADIO BIOLOGY
AND ONCOLOGY**

(Candidates admitted from 2004–2005 onwards)

Time : Three hours

Maximum : 100 marks

**Theory : Two hours and
forty minutes**

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams whenever necessary.

I. Essay :

**1. Discuss on clinical manifestations of normal tissue
damage. (20)**

**2. What are the requirements of ideal brachytherapy
source. Give a note on Cesium – 137 and Ir – 192 source.
(15)**

**3. Discuss on multidisciplinary approach in
Oncology. (15)**

II. Short notes : (6 × 5 = 30)

- (a) Chemo – radiation.
- (b) ICRU – 50.
- (c) Particle beams in radiotherapy.
- (d) Linear Quadratic model in Clinical practice.
- (e) WHO step ladder in pain management.
- (f) Adjuvant radiation.

MARCH 2008

[KS 141]

Sub. Code : 2036

M.D. DEGREE EXAMINATION.

Branch IX — Radiotherapy

GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING
RADIOBIOLOGY
AND ONCOLOGY

Common to all Regulations

Q.P.Code : 202036

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

- I. Essays : (2 × 20 = 40)
1. Describe the acute and late effects following a course of curative radiotherapy to carcinoma cervix and how do you manage them. (20)
 2. What is signal transduction? What is its role in oncology? (20)
- II. Short notes : (10 × 6 = 60)
1. Shrinking field radiotherapy.
 2. Sievert.
 3. Cell Survival curves.
 4. Craniospinal irradiation.
 5. Premalignant lesions of oral cavity.
 6. Mammography
 7. Immobilisation devices.
 8. ^{131}I .
 9. Basal Cell Carcinoma.
 10. Effect of radiation in pregnancy.
-

March 2009

[KU 141]

Sub. Code: 2036

M.D. DEGREE EXAMINATION

**Branch IX – RADIO THERAPY
(Candidates admitted upto 2007-2008)**

**Paper II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code : 202036

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary

Answer ALL questions

I. Essay questions : (2 x 20 = 40)

1. Discuss in detail the basis or principles behind multi modality treatment in cancer.
2. Discuss in detail the functions and differences between tele-cobalt unit and Linear Accelerator.

II. Write short notes on : (10 x 6 = 60)

1. Simulations in Radiotherapy.
2. Mould ram Technique.
3. RBE.
4. Adjuvant radiations.
5. Chemo- radiation.
6. Electron beam therapy.
7. Radio sensitizers.
8. Hyperthermia.
9. Oxygen effect on radiation.
10. Maximum permissible dose.

September 2009

[KV 141]

Sub. Code: 2036

M.D. DEGREE EXAMINATION

**Branch IX – RADIO THERAPY
(Candidates admitted upto 2007-2008)**

**Paper II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code : 202036

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary

Answer ALL questions

I. Essay questions : (2 x 20 = 40)

1. Discuss tissue tolerance dose. Classify tumours in relation to their response to radiation.
2. Explain lymphatic drainage of penis. How would you manage a middle aged man with early penile cancer?

II. Write short notes on : (10 x 6 = 60)

1. Cervical intraepithelial neoplasia.
2. Radiation proctitis.
3. Squamous carcinoma skin.
4. Palliative radiotherapy – principles and practice.
5. Potentially lethal damage.
6. Lymphatic spread in esophageal cancer.
7. Hormonal therapy in breast cancer.
8. IMRT.
9. HDR versus LDR.
10. Immobilization in radiotherapy.

March 2010

[KW 141]

Sub. Code: 2036

M.D. DEGREE EXAMINATION

Branch IX – RADIO THERAPY

**Paper II – (for candidates admitted upto 2007-2008) and
Part II / Paper I – (for candidates admitted from 2008-2009 onwards)**

**GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING
RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code : 202036

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary

Answer ALL questions

I. Essay questions : (2 x 20 = 40)

1. Discuss chemo-radiotherapy in the management of carcinoma cervix.
2. Discuss the cell cycle and its relevance to radiotherapy and chemotherapy.

II. Write short notes on : (10 x 6 = 60)

1. Intra-operative radiotherapy.
2. Oxygen enhancement ratio (OER).
3. Clinical trials.
4. Xeroderma pigmentosum.
5. CHART.
6. Mammography.
7. SAD and SSD techniques.
8. Apoptosis.
9. Radio protectors.
10. Tumor markers.

September 2010

[KX 141]

Sub. Code: 2036

M.D. DEGREE EXAMINATION

Branch IX – RADIO THERAPY

**GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING
RADIOBIOLOGY AND ONCOLOGY**

**Paper II – (for candidates admitted upto 2007-2008) and
Part II - Paper I - (for candidates admitted from 2008-2009 onwards)**

Q.P. Code : 202036

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary.

Answer ALL questions.

I. Essay questions : (2 X 20 = 40)

1. Describe patho-biology and kinetics of Radiation injury in normal tissues.
2. Write a detailed note on molecular pathophysiology of Tumours.

II. Write short notes on : (10 X 6 = 60)

1. Cell cycle re-distribution after radiation.
2. Intra cavitory Brachytherapy.
3. Hypo fractionation.
4. Magna field irradiation.
5. Interstitial implantation.
6. Chemo radiation in cervical cancer.
7. Hypoxic cell sensitizers.
8. The biology of metastasis.
9. Hyperbaric oxygen in Radiotherapy.
10. Accelerated partial breast irradiation.

MAY 2011

[KY 141]

Sub. Code: 2036

**M.D. DEGREE EXAMINATION
BRANCH IX – RADIO THERAPY
GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING
RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code : 202036

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

Pages (Max.)	Time (Max.)	Marks (Max.)
-------------------------	------------------------	-------------------------

- | | | | |
|--|----|----|----|
| 1. Describe Time - Dose Isoeffect formulae and Dose fractionation in radiotherapy. | 11 | 35 | 15 |
| 2. Enumerate the biological consequences of radiation therapy. | 11 | 35 | 15 |

II. Write notes on :

- | | | | |
|---|---|----|---|
| 1. Apoptosis. | 4 | 10 | 7 |
| 2. Tumor suppressor gene. | 4 | 10 | 7 |
| 3. Gated radiotherapy. | 4 | 10 | 7 |
| 4. 4 R's in radiotherapy. | 4 | 10 | 7 |
| 5. Low dose rate continuous irradiation. | 4 | 10 | 7 |
| 6. Involved field radiotherapy in the management of lymphoma. | 4 | 10 | 7 |
| 7. Chemoirradiation in carcinoma nasopharynx. | 4 | 10 | 7 |
| 8. Cell survival curve and LQ model. | 4 | 10 | 7 |
| 9. Radiotherapy in squamous cell carcinoma of the skin. | 4 | 10 | 7 |
| 10. Role of neoadjuvant therapy for carcinoma of the rectum. | 4 | 10 | 7 |

October 2011

[KZ 141]

Sub. Code: 2036

M.D. DEGREE EXAMINATION

BRANCH IX – RADIO THERAPY

**GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING
RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code : 202036

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

Pages (Max.)	Time (Max.)	Marks (Max.)
-------------------------	------------------------	-------------------------

- | | | | |
|---|----|----|----|
| 1. Describe in detail the radiation and chemo effects in cell cycle. | 11 | 35 | 15 |
| 2. Describe in detail, etiology, pathology, clinical features and management of cancer Nasopharynx. | 11 | 35 | 15 |

II. Write notes on :

- | | | | |
|--|---|----|---|
| 1. Midline granulomas. | 4 | 10 | 7 |
| 2. Orbital tumours. | 4 | 10 | 7 |
| 3. Methods of achieving maximum therapeutic ratio. | 4 | 10 | 7 |
| 4. Concomitant boost radiation therapy. | 4 | 10 | 7 |
| 5. Retinoblastoma. | 4 | 10 | 7 |
| 6. Rhabdomyosarcoma in adults. | 4 | 10 | 7 |
| 7. Multiple myeloma. | 4 | 10 | 7 |
| 8. Giant cell tumour of the bone. | 4 | 10 | 7 |
| 9. Breast conservation therapy. | 4 | 10 | 7 |
| 10. Medullary cancer of thyroid. | 4 | 10 | 7 |

[LA141]

April 2012

Sub. Code: 2036

M.D. DEGREE EXAMINATION

BRANCH IX – RADIO THERAPY

**GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING RADIOBIOLOGY
AND ONCOLOGY**

Q.P. Code : 202036

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

	Pages (Max.)	Time (Max.)	Marks (Max.)
1. Describe the four R s in radiobiology and its applications in various fractionations of radiotherapy.	16	35	15
2. What is IMRT. Describe in detail the advantages and disadvantages of IMRT with radiobiological basis.	16	35	15

II. Write notes on :

1. Describe the Radiation sensitizers.	4	10	7
2. Describe the Neutron therapy.	4	10	7
3. Describe the percentage depth dose.	4	10	7
4. Describe the Collimation and its uses.	4	10	7
5. Describe the Electron Contamination.	4	10	7
6. Illustrate the Penumbra.	4	10	7
7. Describe the Radiation protection units.	4	10	7
8. Describe Radio resistance.	4	10	7
9. Describe the Radioisotopes used in Brachytherapy.	4	10	7
10. Describe the Intraluminal brachytherapy.	4	10	7

(LC 141)

APRIL 2013
M.D. DEGREE EXAMINATION
BRANCH IX-RADIO THERAPY

Sub. Code: 2036

GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING
RADIOBIOLOGY AND ONCOLOGY

Q.P.Code: 202036

Time: Three Hours

Maximum: 100 marks

I. Elaborate on:

(2X15=30)

1. Describe in detail about the hypo fractionated Radiotherapy and its radiobiological basis
2. Describe in detail quality assurance procedures Adopted in radiotherapy practices

II. Write notes on:

(10X7=70)

1. Describe the Neoadjuvant therapy
2. Describe the Radiation recall phenomenon
3. Describe the Postoperative Radiation therapy
4. Describe the Electron therapy
5. Describe the Skin sparing effect
6. Describe the Gamma Knife
7. Describe the Adaptive Radiation therapy
8. Describe the Radiobiological basis for fractionated radiotherapy
9. Describe the Tissue Equivalent materials
10. Describe the Radiation Protecting devices

(LE 141)

APRIL 2014

Sub. Code:2036

**M.D. DEGREE EXAMINATION
BRANCH IX - RADIO THERAPY**

**GENERAL PRINCIPLES OF RADIOTHERAPY INCLUDING
RADIOBIOLOGY AND ONCOLOGY**

Q.P.Code: 202036

Time: Three Hours

Maximum: 100 marks

I. Elaborate on:

(2X15=30)

1. Describe the rationale for combined modality in the management of Malignancy.
2. Describe the management of recurrence in cancer.

II. Write notes on:

(10X7=70)

1. Describe the management of nodes in malignancy.
2. Describe the sensitive phase of the cell cycle in radiation.
3. Describe the management of Brain stem gliomas.
4. Describe the methods to achieve the ideal isodose distribution.
5. Describe the management of Cancer nasopharynx T1N3Mo.
6. Discuss the merits and demerits of LDR and HDR.
7. Discuss conformal teletherapy.
8. Discuss Time dose fraction and Lineal quadratic Model.
9. Describe the role of Radiation in Retroperitoneal Tumors.
10. Describe the rationale for radiating benign tumors with examples.

[LG 141]

APRIL 2015

Sub. Code: 2036

M.D. DEGREE EXAMINATION

BRANCH IX – RADIO THERAPY

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P.Code: 202036

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on:

(2 x 15 = 30)

1. Describe the role of Intensity Modulated Radiation therapy in the management of Cancer Breast.
2. Describe the management of cancer Nasopharynx stage T3N1M0.

II. Write notes on:

(10 x 7 = 70)

1. Describe the management of Glioblastoma Multiforme.
2. Describe the management of Medullary carcinoma thyroid.
3. Major Clinical trials in chemoradiation of cervical cancer.
4. Describe the management of malignant Melanoma of the eye.
5. Describe the Prophylactic cranial Radiation therapy.
6. Describe the Stereotactic body radiation therapy in cancer lung.
7. Photodynamic therapy.
8. Describe the principles of Hyperthermia.
9. Describe the biology of metastasis and its management.
10. Describe the management of Acoustic neuromas.

**M.D. DEGREE EXAMINATION
BRANCH IX – RADIO THERAPY**

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P.Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss the Time Dose Fractionation scheme in Radiotherapy and its clinical implications.
2. A 40 year old male has a $T_1N_0M_0$ lesion on the lateral aspect of the anterior 2/3 of the tongue. Describe the various treatment options available with their merits and demerits. Describe in detail the technique of interstitial implantation with reference to HDR.

II. Write notes on:

(10 x 7 = 70)

1. Use of PET CT in Radiotherapy planning.
2. Discuss Radio sensitivity and Radio resistance in radiotherapy practice.
3. Radiation protection and Dose limits.
4. Involved field radiotherapy in the management of lymphoma.
5. Cell survival curves.
6. Discuss the treatment of carcinoma posterior third of tongue with a hard fixed neck node.
7. LET (Linear Energy Transfer).
8. Wedges in Radiotherapy.
9. Tolerance dose of the following with its importance
 - a) Liver
 - b) Lens
 - c) Kidney
 - d) Retina
10. Indications of Total Body Irradiation (TBI). Discuss the technique, dose and precautions to be taken while planning TBI.

**M.D. DEGREE EXAMINATION
BRANCH IX – RADIO THERAPY**

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P.Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Discuss the rationale in combining irradiation with chemotherapy in clinical oncological practice.
2. How will you manage a 35 year old diagnosed to have carcinoma uterine cervix stage IB2? What are the complications of pelvic irradiation and how will you manage them?

II. Write notes on:

(10 x 7 = 70)

1. Modifiers of radiation response.
2. Radiobiology of hypo fractionation.
3. Radiotherapy in squamous cell carcinoma of skin along with various dose fractionation schedules.
4. Role of radiotherapy in anaplastic carcinoma of thyroid.
5. Use of Simulator in Radiotherapy.
6. Clinical application, limitations and implications of QUANTEC.
7. Proton therapy and its potential clinical applications.
8. Radiation Cataractogenesis.
9. Total Skin Electron Radiotherapy.
10. Discuss the radiobiological rationale for altered fractionation schedules.

[LM 141]

MAY 2018

Sub. Code: 2036

**M.D. DEGREE EXAMINATION
BRANCH IX – RADIO THERAPY**

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P.Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Describe the basis of Altered fractionation in Radiotherapy.
2. Classify CNS tumours and give management of glioblastoma multiform.

II. Write notes on:

(10 x 7 = 70)

1. Discuss Medical Oophorectomy.
2. Involved field Radiation.
3. Role of Radiotherapy in benign tumors.
4. Radio protectors.
5. Radiation Cataractogenesis.
6. Management of cystosarcoma phylloides.
7. Molecular targets in colon cancer.
8. Discuss Proton therapy in prostate cancer.
9. Describe the management of Cancer Larynx T₁N₀M₀.
10. Describe the management of Impending spinal cord compression.

M.D. DEGREE EXAMINATION

BRANCH IX – RADIO THERAPY

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Describe accelerated partial breast irradiation in carcinoma breast.
2. Describe characteristics of ideal brachytherapy source and use of Iridium -192.

II. Write notes on:

(10 x 7 = 70)

1. Discuss treatment of early stage of carcinoma glottis.
2. Integral dose.
3. Personnel monitoring devices.
4. Image guided radiotherapy.
5. Implant dosimetry.
6. Craniospinal irradiation in medulloblastoma.
7. Cyberknife.
8. Tumor Lysis syndrome.
9. Management of stage I A in Hodgkins lymphoma right axilla.
10. Bragg peak.

M.D. DEGREE EXAMINATION
BRANCH IX – RADIO THERAPY

PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY

Q.P. Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 15 = 30)**

1. Management of soft tissue sarcoma with special reference to brachytherapy. Discuss the various systems of interstitial brachytherapy. Discuss the suitability of interstitial implant for soft tissue sarcoma and describe the technique and dose prescription as per HDR.
2. List types of pituitary adenoma. Discuss the indications and various techniques of treatment of pituitary adenoma with suitable diagram.

II. Write notes on: **(10 x 7 = 70)**

1. Staging and Management of melanoma of dorsum of left middle toe.
2. ABS guidelines for ideal brachytherapy application. What is ICRU 89?
3. What are the parts of Mediastinum? Name the tumour types seen in each of them.
4. Role of radiotherapy in Wilm's tumour along with technique and dose prescription
5. Write notes on the clinical features, diagnosis, pathology and management of Radiation Proctitis
6. Indications for radiotherapy of carcinoma parotid. Discuss the radiotherapy technique for adenoid cystic carcinoma of parotid.
7. Role of Prophylactic Cranial Irradiation
8. What are the types of Set up Errors? Explain in detail the occurrence of these errors in various steps of radiotherapy planning.
9. Management of well differentiated thyroid cancers
10. Immobilization in radiotherapy

[LS 141]

NOVEMBER 2020
(OCTOBER 2020 SESSION)

Sub. Code: 2036

M.D. DEGREE EXAMINATION

BRANCH IX – RADIO THERAPY

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. What are the fundamentals of pre-operative and post-operative radiotherapy?
Compare both the strategies in carcinoma rectum. Mention few results of important trials.
2. Management of spinal cord compression with indications and current evidence.

II. Write notes on:

(10 x 7 = 70)

1. Write the treatment algorithm for a newly diagnosed squamous cell carcinoma of oesophagus extending from 35-40cm with GE junction at 40cm.
2. Radiotherapy options for low risk localised prostate cancer.
3. Indications of Total skin electron radiotherapy. Discuss the technique, dose and precautions to be taken while planning total skin electron radiotherapy
4. Define Febrile neutropenia and explain its management
5. What is targeted therapy? Discuss its role in Renal cell carcinoma
6. Radiotherapy to neck of a patient diagnosed to have oropharyngeal carcinoma T2N0.
7. Principles of Re-irradiation. Explain how will you proceed with re-irradiation of locally recurrent carcinoma of nasopharynx, treated with radiotherapy 3 years ago.
8. Prophylactic para-aortic nodal radiation in carcinoma cervix.
9. Management of Medullary carcinoma thyroid. What are the syndromes associated with it?
10. Respiratory gating techniques.

[MD 0721]

JULY 2021
(MAY 2021 SESSION)

Sub. Code: 2036

M.D. DEGREE EXAMINATION

BRANCH IX – RADIATION ONCOLOGY

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: (2 x 15 = 30)

1. Discuss various radiotherapy techniques in the management of carcinoma prostate.
2. Discuss plasma cell disorders and management of solitary plasmacytoma.

II. Write notes on: (10 x 7 = 70)

1. Role of radiation in early stage rectal cancers.
2. Anaplastic carcinoma thyroid – pathology and treatment.
3. Briefly explain production of electron beam and their properties.
4. Intraoperative radiotherapy.
5. Prophylactic cranial radiation.
6. Management of kadish stage ‘c’ esthesioneuroblastoma.
7. Management of radiation pneumonitis.
8. Pathophysiology of retinoblastoma.
9. Biomarkers in management of cancer.
10. HPV vaccination.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0522]

MAY 2022

Sub. Code: 2036

M.D. DEGREE EXAMINATION

BRANCH IX – RADIO THERAPY

BRANCH XXVI - RADIATION ONCOLOGY

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. What are the prerequisites of an ideal Brachytherapy source? Give the note on Cesium 137, Ir-192 and Co-60 Source.
2. Describe phases of cell cycle. What is signal transduction? Discuss its role in Oncology.

II. Write notes on:

(10 x 7 = 70)

1. Boron – neutron Capture theory.
2. (a) Describe potential Doubling time.
(b) The Oxygen effects.
3. Define Biological Equivalent Dose and biological Effective Dose.
4. Oncogenes and Tumour Suppressor Genes.
5. Total Body Irradiation.
6. Biological Modifiers.
7. Advantages and disadvantages of Neo adjuvant Chemo radiation. Discuss NACT Schedule in 2 Cancers where it is commonly practiced.
8. Cell survival Curves.
9. Premalignant lesions of vulval carcinoma.
10. Short Notes on Technetium 99 scan and I 131 Scan.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 1022]

OCTOBER 2022

Sub. Code: 2036

**M.D. DEGREE EXAMINATION
BRANCH IX – RADIO THERAPY
BRANCH XXVI - RADIATION ONCOLOGY**

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Describe accelerated partial breast irradiation in carcinoma breast.
2. Discuss staging, risk stratification and management of medulloblastoma.

II. Write notes on:

(10 x 7 = 70)

1. Hazard ratio.
2. Functions of p53 in cell cycle.
3. Perineal implant.
4. Intraoperative brachytherapy.
5. Mucosal melanomas.
6. Role of radiation in Wilms tumour.
7. Bragg Peak.
8. HPV Vaccination.
9. Maximum permissible dose.
10. Tumour markers.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0723]

**JULY 2023
(MAY 2023 EXAM SESSION)**

Sub. Code: 2036

**M.D. DEGREE EXAMINATION
BRANCH IX – RADIO THERAPY
BRANCH XXVI - RADIATION ONCOLOGY**

**PAPER II – GENERAL PRINCIPLES OF RADIOTHERAPY
INCLUDING RADIOBIOLOGY AND ONCOLOGY**

Q.P. Code: 202036

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Dosimetry system in Cancer Cervix Brachytherapy.
2. Radiobiological basis for Chemotherapy and Radiotherapy Interactions.

II. Write notes on:

(10 x 7 = 70)

1. Risk factors for Breast Cancer and methods for Risk Reduction.
2. Bone Scan.
3. Dose response curves in Radiotherapy.
4. Proton therapy – Merits and Demerits.
5. Hereditary Cancers.
6. Prostate Cancer Risk Stratification.
7. HPV Positive Oropharyngeal Cancer Treatment.
8. Land Mark Trials in Head and Neck Cancer irradiation.
9. Cyber knife.
10. Dysphagia aspiration related structure dose limits.
