SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH
(A DEEMED TO BE UNIVERSITY)

# B.Sc. Allied Health Sciences Second Year Semester-IV

**September 2021 Examination**

## B.Sc. Radiotherapy Technology

**Time: 3 Hrs.** **Paper – I** **[Max. Marks: 100]**

## Applied Anatomy & Pathology

*Your answers should be specific to the questions asked.*
*Draw neat labelled diagrams wherever necessary.*
***(Use separate answer booklet for Section A & B)***

**Section – A**

**Applied Anatomy** (50 Marks)

**Q.P Code : J4585**

**LONG ESSAY** **2 X 10 = 20 Marks**

1. Name the parts of gastrointestinal system and briefly describe the structure and function of each part.
2. Discuss urinary bladder under the following headings
   a) external features b) relations c) ligaments d) applied anatomy (3+2+4+1)

**SHORT ESSAY (Answer any three)** **3 X 5 = 15 Marks**

3. Discuss the coverings, lobes and applied anatomy of prostate
4. Name the parts of Pharynx and mention its muscles.
5. Describe the microscopic structure of Thyroid gland
6. Mention the parts & relations of uterus
7. Discuss the gross features and relations of liver

**SHORT ANSWERS (Answer any five)** **5 X 3 = 15 Marks**

8. Name the parts of gall bladder
9. Describe the parts of large intestine.
10. Name the branches of abdominal aorta
11. List the branches of medial cord of brachial plexus
12. Mention the stages of menstrual cycle.
13. List the functions of liver.
14. List the cranial nerves.

**Section – B**

**Applied Pathology** (50 Marks)

**Q.P Code : J4586**

***(Use separate answer booklet for Section-B)***

**LONG ESSAY** **2 X 10 = 20 Marks**

1. Classify and describe the etiopathogenesis, morphology, clinical course, spread and complications of Colon cancer
2. Classify and describe the etiopathogenesis, morphology, clinical course, spread and complications of Lung cancer

**SHORT ESSAY (Answer any three)** **3 X 5 = 15 Marks**

3. Describe the etiopathogenesis, morphology, clinical course, spread and complications of Seminoma
4. Classify Lymphomas
5. Describe the etiopathogenesis, morphology and clinical course of Breast Carcinoma
6. Classify thyroid cancers
7. Describe the etiopathogenesis and morphology of prostate cancer

**SHORT ANSWERS (Answer any five)** **5 X 3 = 15 Marks**

8. Pap smear
9. Describe the microscopy of Squamous cell carcinoma
10. Name 03 types of CNS tumors
11. Etiopathogenesis of bladder cancer
12. Etiopathogenesis of gastric carcinoma
13. Paraneoplastic syndrome
14. Name 03 benign soft tissue tumors

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# B.Sc. Allied Health Sciences Second Year Semester-IV

**September 2021 Examination**

**B.Sc. Radiotherapy Technology**

**Time : 3 Hrs.** **Paper – II** **[Max. Marks : 100]**

## Radiation Safety in radiotherapy

**Q.P Code: J4590**

*Your answers should be specific to the questions asked.*
*Draw neat labelled diagrams wherever necessary.*

**LONG ESSAY** **2 X 10 = 20 Marks**

1. Discuss about TLD dosimeter, Its working principle and state rules for proper use of TLD badges.
2. Radiation Protection Survey of High Energy Linear Accelerator

**SHORT ESSAY (Answer any Ten)** **10X 5 = 50 Marks**

3. Differences between SSD and SAD treatment techniques.
4. Write about the physical characteristics of radioisotopes used in brachytherapy source.
5. The role of electron beams in Radiotherapy.
6. What are the factors affecting the image quality in diagnostic.
7. Write the differences between Magnetron and Klystron.
8. Write about the light and radiation field congruence test.
9. Write about the physical parameters of dosimetry PDD, TMR and TPR.
10. What are the QA checks done daily, monthly and annually with tolerance for telecobalt unit.
11. Bolus materials and their uses.
12. How to handle the emergency situation of radioactive source being struck inside brachytherapy applicator?
13. Define (i) Workload (W) (ii) Use Factor (U) (iii) Occupancy Factor (T) and (iv) Distance in shielding calculation for a radiation installation.
14. Responsibilities of licensee and employer.

**SHORT ANSWERS (Answer any Ten)** **10 X 3 = 30 Marks**

15. Compare the planning aspects of Teletherapy and Brachytherapy installations.
16. What is the type of target used in a linear accelerator?
17. Dose Volume Histograms (DVH).
18. Draw a block diagram of linear accelerator.
19. Define HVL and TVL in radiation shielding and obtain relation between two.
20. Why do you recommend installing (a) T-rod & (b) Gamma Zone monitor in a telecobalt room? What are their functions?
21. What is the use of breast board immobilization device?
22. What is penumbra? What are the types?
23. Calculate the equivalent square field for 12 x 10 $cm^2$ and 5 x 9 $cm^2$
24. Permanent implants.
25. What is the source dimension of Co-60? Also give the activity and dose rate normally used at the time of source loading.
26. What are the different types of brachytherapy based on the dose rate?

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# B.Sc. Allied Health Sciences Second Year Semester-IV

**September 2021 Examination**

**B.Sc. Radiotherapy Technology**

**Time : 3 Hrs.** **Paper – III** **[Max. Marks : 100]**

## Radiation Biology and principles of Radiotherapy

**Q.P Code: J4600**

*Your answers should be specific to the questions asked.*
*Draw neat labelled diagrams wherever necessary.*

**LONG ESSAY** **2 X 10 = 20 Marks**

1. Explain the physics and chemistry of Radiation absorption
2. Explain the Multidisciplinary management of cancer. Write in brief about Radiotherapy, chemotherapy and Surgery for the treatment of cancer.

**SHORT ESSAY (Answer any Ten)** **10X 5 = 50 Marks**

3. Explain split course RT and Accelerated fractionation RT
4. Acute effects of Total body radiation
5. Describe the characteristics of stochastic and deterministic effects of ionising radiation. Give an example for each effect.
6. Cell survival curve.
7. Cell cycle and radiosensitivity of cells in each phase of cell cycle.
8. Describe the radiation effects in the developing embryo and foetus.
9. TNM staging of cancer.
10. Principles of Radiation protection.
11. What is Brachytherapy? Explain its rationale & common techniques
12. Discuss the characteristics of the oxygen effect during radiation therapy.
13. Development of cancer- explain in detail.
14. Explain the chromosomal aberrations secondary to radiation.

**SHORT ANSWERS (Answer any Ten)** **10 X 3 = 30 Marks**

15. Define oxygen enhancement ratio (OER) and give a value for low LET radiation.
16. What is a GENE?
17. Define Relative biological effectiveness.
18. Define the term "$\alpha/\beta$ ratio" as it applies to the linear quadratic model.
19. Name the 3 most important modalities of cancer treatment.
20. What is cancer chachexia?
21. Name 3 acute side effects of Radiotherapy to pelvis and their treatment.
22. Name 3 late side effects of Radiotherapy to Head and neck.
23. Explain 3 principles of care during sedation/anaesthesia.
24. Name the 3 staging systems commonly used for cancer
25. Explain the importance of fractionation in outcome of radiation therapy.
26. Name 3 physical effects of cancer on body