

**SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH**

(A DEEMED TO BE UNIVERSITY)

**B.Sc. Allied Health Sciences Third Year (Semester-V)**

**February 2019 Examination**

**B.Sc. Imaging Technology**

**Time : 2.30Hrs.**

**[ Max. Marks : 80]**

**Paper-I**

**Physics Of Ultrasound With PCPNDT act**

**Q.P Code : J5410**

*Your answers should be specific to the questions asked.*

*Draw neat labeled diagrams wherever necessary.*

**LONG ESSAY**

**2 X 10 = 20 Marks**

- 1 What are the characteristics of ultrasound imaging? Discuss about reflection, refraction and attenuation of ultrasound waves. (4 + 2 + 2 + 2)
- 2 Write in detail about the parts of ultrasound machine.

**SHORT ESSAY (Answer any six)**

**6 X 5 = 30 Marks**

- 3 What is procedure for sterilization of ultrasound probe in OT?
- 4 Discuss about time gain compensation and its importance in performing ultrasound study.
- 5 What is meant by PCPNDT Act? Discuss at least 4 salient features. (2 + 3)
- 6 What are near field or Fresnel zone and far field or Fraunhofer zone in ultrasound?
- 7 Explain about the ultrasound displays Mode B with neat diagram.
- 8 What are the different types of arrays used in ultrasound?
- 9 Describe about tissue harmonic imaging? What is it used for?
- 10 What is Doppler principle? Discuss its uses in diagnostic ultrasonography. (1 + 4)

**SHORT ANSWERS (Answer any Ten)**

**10 X 3 = 30 Marks**

- 11 Piezoelectric effect.
- 12 What is meant by mirror artifact? Give an example of mirror artifact.
- 13 Doppler effect.
- 14 What are the common ultrasound guided interventional performed (name any three )
- 15 Discuss about reverberation artifacts and where is it seen?
- 16 Properties of ultrasound.
- 17 Discuss any three steps undertaken in performing quality assurance/quality control of ultrasound unit.
- 18 Electronic acoustic coupling media.
- 19 Write in brief about history of ultrasound.
- 20 What is ultrasound phantom made of? List any 3 materials.
- 21 Real time color flow imaging.
- 22 What is meant by 'aliasing'?

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**Paper-II**

**Physics of computed tomography and imaging technique**

**Q.P Code : J5420**

*Your answers should be specific to the questions asked.*

*Draw neat labeled diagrams wherever necessary.*

**LONG ESSAY**

**2 X 10 = 20 Marks**

- 1 Explain in detail about the CT imaging of the head.
- 2 What is QA procedure? Explain any three monthly QA procedures.

**SHORT ESSAY (Answer any six)**

**6 X 5 = 30 Marks**

- 3 How to do the field uniformity check in CT scan?
- 4 Write a short note about iterative methods in image reconstruction algorithm.
- 5 Explain : linear attenuation and mass attenuation coefficients.
- 6 Describe multi planar reconstruction.
- 7 Give a short notes on (i) beam hardening artifact (ii) ring artifacts.
- 8 Explain in detail about contrast used in CT scan.
- 9 Discuss steps performing abdominal CT? What is advantage of spiral CT?
- 10 Describe the procedure of CT guided lung biopsy

**SHORT ANSWERS (Answer any Ten)**

**10 X 3 = 30 Marks**

- 11 Dose optimisation in CT scan.
- 12 What is attenuation number in CT scan?
- 13 Define : Window level and window width.
- 14 What is effective dose?
- 15 What are the types of scan in CT?
- 16 Streaking artifact in CT scan.
- 17 Oral contrast in CT scan.
- 18 What is beam pitch in CT scan?
- 19 Give a short note on third generation CT scan.
- 20 Basic principle of CT.
- 21 Classify iodinated contrast media.
- 22 What is advantage of spiral CT?

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**Time : 2.30 Hrs.**

**[ Max. Marks : 80]**

**Paper-III**

**Mammography and Nuclear medicine**

**Q.P Code : J5430**

*Your answers should be specific to the questions asked.*

*Draw neat labeled diagrams wherever necessary.*

**LONG ESSAY**

**2 X 10 = 20 Marks**

- 1 Write about the principle and working of Digital radiography.
- 2 Describe the basic principle of rectilinear scanner and focused collimator for scanning.

**SHORT ESSAY (Answer any six)**

**6 X 5 = 30 Marks**

- 3 Common radiopharmaceuticals and their uses in nuclear medicine
- 4 Preparation of radiopharmaceuticals.
- 5 Uses of SPECT in parathyroid imaging
- 6 What are the precautions are taken during handling of radiopharmaceuticals?
- 7 Explain the ionization chamber and GM counter and their uses in nuclear medicine.
- 8 What is PACS? Write about types and uses.
- 9 Write about mammography.
- 10 Describe the quality control tests for a Gamma camera – flood field uniformity, total system uniformity.

**SHORT ANSWERS (Answer any Ten)**

**10 X 3 = 30 Marks**

- 11 Radionuclide Iodine-131.
- 12 Write about properties of gamma rays
- 13 Principles of tracer technique.
- 14 Uses of technetium 99m.
- 15 Define radioactivity and give its unit.
- 16 Write about alpha and beta decay.
- 17 What is effective half-life?
- 18 Write about crystal using in detectors.
- 19 Radiation protection –time , distance and shielding.
- 20 Isomeric transmission.
- 21 Write about the type of gamma cameras.
- 22 Define Half-life and tenth-life.

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