

## Assessment Procedure

### **Introduction to Biomedical Imaging Techniques- CPCC22**

The assessment of 'Introduction to Biomedical Imaging Techniques' was done by a descriptive exam and MCQ. The exam was out of 30 and MCQ was out of 20. The minimum pass mark for the exam is 50%. Those who secured the minimum for both qualified this course. A sample question paper is given below:

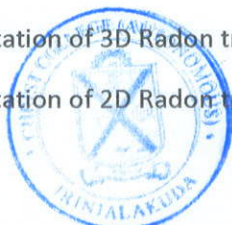
### **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA VALUE ADDED CERTIFICATE COURSE EXAMINATION, MARCH 2019 CVAC020- PERSONALITY DEVELOPMENT**


**TIME: 2 Hours**

**MAX. MARKS: 50**

**Answer all questions each questions carry one mark**

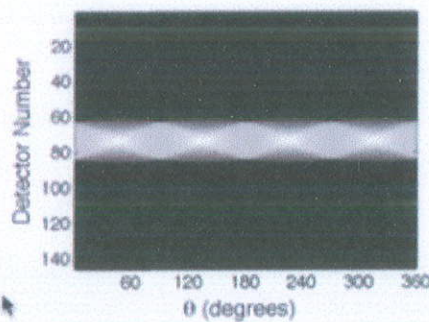
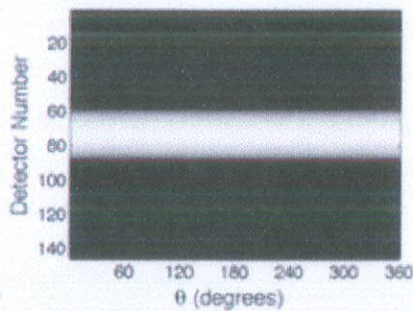
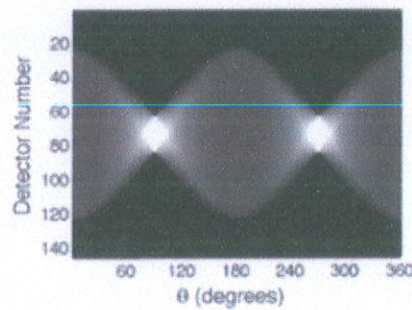
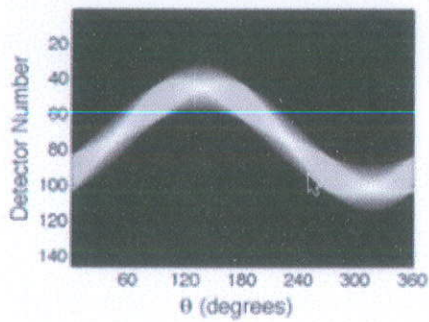
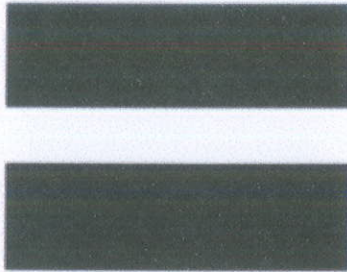
1. The radio frequency needed to make the unpaired protons flip is the Larmor frequency.
  - a) True
  - b) False
2. In the formula for Compton scattering, the difference between the wavelengths of an incident and scattered proton is directly proportional scattering angle.
  - a) True
  - b) False
3. Bone absorbs x-rays particularly well and shows up as gray and/ or black on an image, while air and soft tissues such as muscle, which have lower densities than bone, absorb less x-rays and show up as white.
  - a) True
  - b) False
4. Which of the following is NOT commonly imaged with x-rays and/ or x-ray CT.
  - a) Teeth
  - b) Aneurysm coils
  - c) Pregnant women
  - d) Breast cancer
5. Sinograms can be used to form CT images using filtered back projection.
  - a) True
  - b) False
6. What is a sinogram?
  - a) Graphical representation of 1D Radon transform.
  - b) Graphical representation of 3D Radon transform.
  - c) Graphical representation of 2D Radon transform.



  
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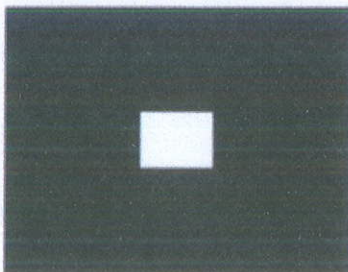
d) Graphical representation of 2D Radon transform.

7. What will the sinogram look like for the following pattern?



8. What will the sinogram look like for the following pattern?

(options same as above)



*Handwritten signature*



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9. In which year ultrasound was first proposed to visualize internal organs?

- a) 1950
- b) 1965
- c) 1945
- d) 1970

10. 1 Tesla=?

- a)  $10^2$  Gauss
- b)  $10^3$  Gauss
- c)  $10^4$  Gauss
- d)  $10^5$  Gauss

11. The thickness of the CT slice is .....

- a) 1-10 nm
- b) 1-10 mm
- c) 1-100  $\mu\text{m}$
- d) 0.1-10 mm

12. X-ray was discovered in which year?

- a) 1895
- b) 1905
- c) 1889
- d) 1900

13. First magnetic resonance imaging was done in which year?

- a) 1971
- b) 1972
- c) 1981
- d) 1987

14. In which process energy is shared between photon and electron?

- a) Photoelectric effect
- b) Compton scattering
- c) Pair production
- d) Pair annihilation



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15. Which of the following is not a noise artifact in ultrasound imaging?

- a) speckle
- b) sagittal
- c) clutter
- d) shadowing

16. The spatial resolution of an imaging system is most directly related to:

- a) Visibility of large low contrast objects.
- b) Visibility of noisy images.
- c) Visibility of soft tissues.
- d) Visibility of anatomical detail.

17. Compare MRI to CT ("CAT scans"). Which is true?

- a) Both methods use X-rays, but exposure is higher with CT.
- b) CT reveals soft structures, while MRI is better at dense material, such as bone.
- c) Both methods produce cross-sectional images at a specified plane through the body.

18. What does "MRI" stand for?

- a) Magneto-Ray Idometry
- b) Medical Radiometry Instrument
- c) Magnetic Resonance Imaging
- d) Maximal Radiology Imaging

19. Larmor frequency depends upon the

- a) individual nucleus
- b) magnetic flux density
- c) both a and b
- d) energetic flux unit

20. Bones look white in X-ray photograph because

- a) they are bad absorbers of x-rays
- b) they reflect x-rays
- c) they are good absorbers of x-rays
- d) they are bad absorbers of ultraviolet rays.




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(20\*1=20)  
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**Answer six questions Each carry five marks**

- .26. What is ionization?
- .29. Explain the production of X-rays.
- .30. Write a note on electromagnetic radiation.
- .37. What are the advantages and disadvantages of ultrasound imaging?
- .39. What are the main noise artifact associated with ultrasound imaging?
- .40. What are the advantages of using pulsed laser diodes (PLDs) for photoacoustic imaging

(6\*5=30)



  
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