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Reg. No.....

Name.....

M.Sc. (BIOMEDICAL INSTRUMENTATION) DEGREE EXAMINATION SEPTEMBER 2023

Second Semester

BIOPHOTONICS AND NON-RADIATING MEDICAL IMAGING TECHNIQUES

(2016 Admission onwards—Regular/Supplementary/Mercy Chance)

Time : Three Hours Maximum Marks : 100

Part A

Answer any **five** *questions.*
Each question carries 10 *marks.*

1. Explain populations inversion and how it is achieved.
2. Explain the role of LASER in surgery.
3. What are the applications of holography ?
4. Explain the production and detection of Ultrasonics.
5. Explain with diagram the principle of an Ultrasound pulse echo imaging system.
6. Explain the image acquisition and reconstruction techniques in MRI systems.

(5 × 10 = 50)

Part B

Answer any **ten** *questions.*
Each question carries 5 *marks.*

1. Explain the conditions for Laser action.
2. Explain the applications of liquid lasers.
3. Write a note on Laser Safety Management System.
4. Explain the characteristics of Holographic Media.
5. Explain the basics of Holographic Computer.

Turn over

6. Write a note on Fourier Optics.

7. Explain the characteristics and properties of Ultrasonic Waves.

8. Write a note on Colour Doppler.

9. Explain how Ultrasonics are used in the diagnosis of eyes.

10. Explain the basic principles of 2D scanners.

11. Write a note on the magnets used in MRI instrumentation.

12. Explain the applications of NMR spectroscopy.

(10 × 5 = 50)