Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: _VII_ (BMI) Engineering
Regular Examination November – December 2013
Subject Name with Code: Advanced Medical Imaging Techniques (2BM701)

Time: 3 Hours / As per Scheme

Total Marks: 70

Instruction:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Section - I

Que. – 1

(a) What is the working principle of computed tomography? Explain components of CT system. (06)

(b) Explain the back projection reconstruction method. And also suggest the modifications required when applied to fan beam type scanner. (06)

OR

Que. – 1

(a) Compare all modes of CT scan with schematic diagrams. (06)

(b) Explain working of spiral CT. suggest the modification required in instrumentation of conventional CT for the Spiral CT. (06)

Que. – 2

(a) Explain the methods of Radionuclide productions. (06)

(b) Explain internal radiation dosimetry and Biological effect of radionuclide. (05)

OR

Que. – 2

(a) Explain the instrumentation of GAMMA camera. (06)

(b) Explain Anger position network for detecting the location of gamma rays. (05)

Que. – 3

(a) Explain iterative reconstruction method with necessary equations and schematic. (06)

(b) Explain following terms (06)

1) Half value layer

2) Free induction decay in MRI

3) Units of Radioactivity.

Que. – 4

(a) Explain the types of coils used in the MRI with necessary diagram. (06)

(b) Explain Inversion recovery pulse sequence with clinical application. (06)

OR

Que. – 4

(a) Give the importance of RF pulse. Explain resonance phenomena in MRI. (06)

(b) Give clinical uses and safety aspects of MRI. (06)

Que. – 5

(a) Explain slice select gradient. (06)

(b) Write a short note on infrared photography. (05)

OR

Que. – 5

(a) Explain the phase encoding gradient with necessary schematics. (06)

(b) Write a short note on transillumination with clinical application. (05)

Que. – 6

(a) Explain general principle and instrumentation of PET scanner. (06)

(b) Explain working rectilinear scanner with necessary diagram. (06)

END OF PAPER