Reg. No.									

MANIPAL UNIVERSITY

FIRST SEMESTER ME MEDICAL SOFTWARE DEGREE EXAMINATION – NOVEMBER 2015

SUBJECT: MMS 611 – MEDICAL IMAGING

Wednesday, November 25, 2015

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

1. Explain the arithmetic and logical operations for image processing and describe how it affects the appearance of the image.

(10 marks)

2. What are histograms? How are they helpful in describing the quality of an image? Explain what is meant by histogram equalization? How is it useful to enhance the quality of an image?

(2+3+3+2 = 10 marks)

3. What is a derivative filter? Explain first and second order derivative filters. Name one example of each type of filter.

(2+6+2 = 10 marks)

4. What is DICOM? Describe the role of DICOM in a healthcare communication scenario.

(10 marks)

5. **Write short notes on:**

5A. Application Entity title
5B. Service object pair class
5C. Transfer Syntax
5D. Value representation

(2½ marks × 4 = 10 marks)

6. Describe Association Handling as part of DICOM communication.

(10 marks)

7. Write short notes on Beam restrictors and Collimators in XRay imaging systems.

(5+5 = 10 marks)

8. Describe the overall procedure of MR imaging and explain how it helps in medical diagnostics.

(10 marks)

9. Describe how sound waves are used in medical imaging. Describe the benefits, drawbacks of ultrasound imaging. Also explain the artifacts involved in ultrasound imaging.

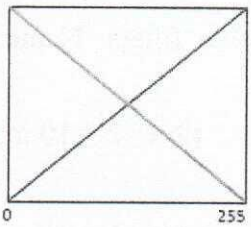
(4+2+4 = 10 marks)

10. Pixel values of an image I are listed as below:

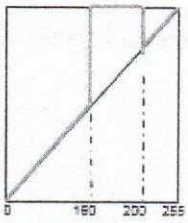
75	81	101	121	177	179
109	151	111	120	189	190
102	158	161	180	152	155
179	178	180	181	182	151
10	24	210	182	232	252
10	43	212	180	241	251

Show the matrices corresponding to the image processing operations represented by the following transfer functions.

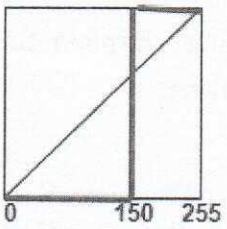
(a)



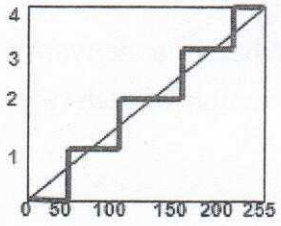
(b)



(c)



(d)



(2½ marks × 4 = 10 marks)