

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES FIRST SEMESTER MASTER OF ENGINEERING- ME (MEDICAL SOFTWARE) **DEGREE EXAMINATION - NOVEMBER 2017** DATE: Monday, November 20,2017 TIME : 10:00AM - 1:00PM Medical Imaging [MMS 611]

Marks: 100

Α

Answer all the questions.

All questions carry equal marks

- 1) (10)Explain the arithmetic and logical operations for image processing and describe how it affects the appearance of the image. 2) (10)What are histograms? How are they helpful in describing the guality 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 marks)(10)What is a derivative filter? Explain first and second order 3) derivative filters. Name one example of each type of filter. (2+6+2)marks) 4) What is DICOM? Describe the role of DICOM in a healthcare ⁽¹⁰⁾ communication scenario. 5) (10)Write short notes on (a) Application Entity title (b) Service object pair class (c) Transfer Syntax and (d) Value
 - representation

(2.5 X 4 marks)

- Describe Association Handling as part of DICOM 6) (10)communication.
- 7) Write short notes on Beam restrictors and Collimators in (10)XRay imaging systems.(5+5 MARKS)
- 8) Describe the overall procedure of MR imaging and explain (10)how it helps in medical diagnostics.
- ⁹⁾ Describe how sound waves are used in medical imaging. Describe the ⁽¹⁰⁾ benefits, drawbacks of ultrasound imaging. Also explain the artifacts

Duration: 180 mins.

involved in ultrasound imaging.

(4+2+4 marks)

¹⁰⁾ Pixel values of an image I are listed as below (2.5 X 4 marks)

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.



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(10)