Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **17BM3002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MEDICAL IMAGE COMPUTING** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Examine the histogram for various levels of image contrast. Illustrate how do you use histogram equalization to obtain better contrast. | CO3 | 10 |
| b. | Justify the use of the following intensity transformation functions  i. logarithmic and ii. power law. | CO4 | 10 |
| (OR) | | | | |
| 2. | a. | Investigate the cause for ringing effects in frequency domain filters | CO4 | 6 |
| b. | Discuss the following properties of 2D Discrete Fourier Transform i. Separability ii. Translation and iii. Rotation. | CO1 | 10 |
| c. | With neat diagram outline the basic steps of filtering in frequency domain. | CO3 | 4 |
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| 3. | a. | Explain the effect of illumination on thresholding. | CO5 | 5 |
| b. | Describe the procedure to estimate global threshold. Discuss its draw back and ways to overcome it. | CO1 | 15 |
| (OR) | | | | |
| 4. | a. | Describe the following morphological algorithms i. Region filling ii. Extraction of connected components and iii. Thinning. | CO1 | 15 |
| b. | Discuss about level set segmentation. | CO3 | 5 |
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| 5. | a. | List the various types of interpolation. Detail the bilinear interpolation and suggest the best method for medical images. | CO2 | 10 |
| b. | Give the translation and rotation matrix for 2D and 3D images. | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Define reformatting and its types to generate new slices in 3D dataset. | CO1 | 9 |
| b. | Illustrate the effect of changing the order of translation and rotation on the outcome. | CO3 | 8 |
| c. | What are the three components used in image guided therapy? | CO1 | 3 |
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| 7. | a. | Discuss the local and global optimization strategies. | CO1 | 12 |
|  | b. | Analyze the registration technique using fiducial markers. | CO4 | 8 |
| (OR) | | | | |
| 8. | a. | Discuss the concept of ray casting towards rendering. Give the details of Maximum Intensity Projection and Digitally Rendered Radiograph techniques. | CO1 | 10 |
|  | b. | Suggest the things to be done to achieve good registration results. | CO2 | 10 |
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|  | | **Compulsory:** |  |  |
| 9. | a. | Discuss in detail the Radon transform and its application in medical field. | CO1 | 8 |
|  | b. | With necessary diagram describe the various stages of filtered back projection method. | CO1 | 12 |