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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **16EC2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **FUNDAMENTALS OF DIGITAL IMAGE PROCESSONG** | **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. | Explain the application of image processing in the areas of medical, industrial, surveillance and law enforcement. | CO1 | 12 |
| b. | Analyze the separability, translational, periodicity and rotational properties of two dimensional Discrete Fourier Transform. | CO1 | 8 |
| **(OR)** | | | | |
| 2. | a. | Discuss the cause for checker board pattern and false contouring. | CO1 | 8 |
| b. | Compare basic color models and show the conversion from RGB to HSI. | CO1 | 12 |
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| 3. | a. | Illustrate m-adjacency versus 8-adjacency in finding thin edges in an image. | CO1 | 8 |
| b. | Explain the steps involved in edge detection using suitable gradient operators. | CO1 | 12 |
| **(OR)** | | | | |
| 4. | a. | Show the histogram of images with various contrast levels. | CO1 | 6 |
| b. | Infer the methods of order statistical filters. | CO1 | 8 |
| c. | Discuss the use of bit plane slicing and gamma correction. | CO1 | 6 |
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| 5. | a. | Explain the procedure for image segmentation based on global thresholding. | CO2 | 8 |
| b. | Discuss the effect of illumination on segmentation and the remedial measure to overcome it. | CO2 | 8 |
| c. | Compare global, local and adaptive thresholding methods for image segmentation. | CO2 | 4 |
| **(OR)** | | | | |
| 6. | a. | Discuss the basic formulation for region based image segmentation. | CO2 | 6 |
| b. | Illustrate the region splitting and merging method for image segmentation. | CO2 | 8 |
| c. | Outline the properties and application of image segmentation. | CO2 | 6 |
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| 7. | a. | Explain with a diagram the details of image compresson model. | CO3 | 10 |
| b. | Illustrate the procedure for Huffman coding. | CO3 | 10 |
| **(OR)** | | | | |
| 8. | a. | Estimate the code for the message a1a2a3a3a4 using arithmetic coding given: p(a1) = 0.2, p(a2) = 0.2, p(a3) = 0.4, p(a4) = 0.2 | CO3 | 10 |
| b. | Discuss the basic steps of JPEG compression standard. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Elaborate the dilation and erosion operations and its uses. | C01 | 8 |
| b. | Illustrate boundary extraction using morphological operators. | CO1 | 9 |
| c. | List the uses of image morphology. | CO1 | 3 |