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



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

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| **Code :** | **17EC2041** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PRINCIPLES OF DIGITAL IMAGE PROCESSING** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Discuss about the applications of digital image processing and explain a case study in detail. | CO1 | 20 |
| **(OR)** | | | | |
| 2. | a. | Label the structure of human eye and explain the function of the anatomical parts with neat diagram. | CO1 | 15 |
| b. | Solve the given condition to find the physical size of an image which is 1200 pixels wide and 1200 pixels high. The image was scanned at 600 dpi. | CO1 | 5 |
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| 3. | a. | Outline the elements involved in the process of digital images. | CO1 | 8 |
| b. | List any three distance metrics to calculate the distance between two pixel coordinates. | CO1 | 6 |
| c. | Explain the basic relationship between pixels in a digital image. | CO1 | 6 |
| **(OR)** | | | | |
| 4. |  | Explain in detail the fundamental steps involved in solving a problem in the area of image processing and analysis. | CO4 | 20 |
|  |  |  |  |  |
| 5. | a. | What is the need for histogram plot? Describe the histogram equalization and matching process with suitable example. | CO3 | 12 |
| b. | Make use of the two images and perform image addition and subtracion. Assume both the images are of the **8 bit** integer type.  and | CO3 | 8 |
| **(OR)** | | | | |
| 6. | a. | Relate the need for image enhancement with suitable examples and explain the concept of image averaging and subtraction. | CO3 | 12 |
| b. | Make use of the image and the mask to find a spatial filtered image output.  and | CO3 | 8 |
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| 7. | a. | How will you perform image sharpening using frequency domain filters? Support your answer with necessary mathematical equations. | CO5 | 12 |
| b. | Outline the color image enhancement process. | CO2 | 8 |
| **(OR)** | | | | |
| 8. | a. | Discuss the role of inverse and wiener filtering in the process of image restoration. | CO3 | 12 |
| b. | Show the image restoration and degradation model. | CO3 | 8 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Demonstrate the edge detection process in digital images. | CO6 | 8 |
| b. | Define thresholding and discuss the types and application of thresholding concepts in image analysis. | CO6 | 12 |