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



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

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| **Code :** | **16EC2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **FUNDAMENTALS 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. | a. | Sketch the human eye and describe the anatomical structures with its functions. | CO1 | 15 |
| b. | List the applications of Digital image processing. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Write the chessboard and Euclidean distance equation between p(x,y) and q(s,t). | CO1 | 5 |
| b. | Explain the basic intensity gray level transformations available for image enhancement with mathematical equations. | CO1 | 15 |
|  |  |  |  |  |
| 3. |  | Indicate the significance of Discrete Fourier transform and write the forward and reverse equation.List the properties and applications of the same. | CO1 | 20 |
| (OR) | | | | |
| 4. | a. | Illustrate the process of spatial smoothening filter with necessary equations. | CO2 | 15 |
|  | b. | Write short notes on histogram processing. | CO2 | 5 |
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| 5. | a. | Estimate the transfer function of 2nd order Butterworth Low pass filter for Do Value of 15 and D (u,v) values of 10, 20 and 30. Plot the graph between H(u,v) and D(u,v). | CO2 | 10 |
|  | b. | Explain the process involved in homomorphic filtering with neat sketch. | CO2 | 10 |
| (OR) | | | | |
| 6. |  | Summarize the various noise probability functions for noise models used in digital image processing. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | Draw the image restoration and degradation model and explain the concept. | CO3 | 10 |
|  | b. | Write short notes on color image processing. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Encode the following data A={a,b,c,d,e,f} with probabilities (0.2, 0.1, 0.1 , 0.2 , 0.1 , 0.3) respectively using Huffman coding. | CO3 | 15 |
| b. | Summarize the technical concepts of variable length coding. | CO3 | 5 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the following morphological operators in detail:   1. Erosion 2. Dilation 3. Hit-miss operation. | CO3 | 15 |
|  | b. | Find the value of logical operation AND for the binary images A and B. Assume 1 to be the foreground and 0 to be the ground pixels. | CO3 | 5 |

ALL THE BEST