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

G:\logo and QP Template\logo 3 Feb 2018 final.tif

**End Semester Examination – Nov/Dec – 2018**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **15EI2013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MEDICAL IMAGE COMPUTING** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Give a detailed explanation on   1. Brightness Adaptation. 2. Brightness Discrimination. | CO1 | 12 |
| b. | Explain the need of logarithmic and power-law transformations. | CO3 | 8 |
| (OR) | | | | |
| 2. | a. | Justify the statement that“The subjective brightness is not a function of intensity alone.” | CO2 | 6 |
| b. | Suggest and explain a method to derive a sharpened image. | CO1 | 10 |
| c. | Explain a laplacian operator and its output. | CO1 | 4 |
|  |  |  |  |  |
| 3. | a. | Elaborate on the i) Order statistics filter and ii) Mean filter. Also state their need in image restoration of noisy images. | CO3 | 14 |
|  | b. | What are the types of degradation? | CO2 | 6 |
| (OR) | | | | |
| 4. | a. | Briefly explain the objective and strategy of image restoration. | CO1 | 4 |
|  | b. | Explain Gaussian and Exponential noise model. | CO1 | 10 |
|  | c. | Prove that pseudo-inverse filter performs better than inverse filter in image restoration. | CO3 | 6 |
|  |  |  |  |  |
| 5. | a. | Give a detailed explanation on the strategy to exploit the data redundancies for image compression. | CO1 | 12 |
|  | b. | Demonstrate how image compression can be achieved using arithmetic coding. | CO2 | 8 |
| (OR) | | | | |
|  | a. | Explain briefly the cause for image degradation and the strategy to restore the degraded image. | CO1 | 8 |
|  | b. | Explain the terms (i) mapper (ii) quantizer (iii) symbol endcoder and (iv) relative data redundancy. | CO3 | 12 |
|  |  |  |  |  |
| 7. | a. | Explain region-based segmentation and discuss the application of image segmentation. | CO3 | 10 |
|  | b. | Elaborate on how simultaneous dynamic range compression and contrast enhancement is achieved using Homomorphic filtering. | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | Explain in detail about image descriptors and its types. | CO2 | 12 |
|  | b. | Determine the shape number of shapes of order 6 and 8. | CO2 | 8 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain briefly the translational property of 2D DFT. Give the Walsh basis matrix for N = 8. | CO1 | 8 |
|  | b. | Describe the image compression model addressing the various types of data redundancy with diagrams. | CO3 | 12 |