**M S Ramaiah Institute of Technology**

**(Autonomous Institute, Affiliated to VTU)**

**Department of Information Science and Engineering**

**Programme: B. E. in Information Science and Engineering**

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| --- | --- | --- | --- |
| Term: | **17.08.2016 to 17.12.2016** | Course Code: | **IS52A1** |
| Course: | **Digital Image Processing** | Semester: | **V** |
| CIE: | **Test – 2** | Max Marks: | **30** |
| Date: | **12/11/2016** | Time: | **1hr** |

**Portions for Test:** L21-L40

**Instructions to Candidates**: **Answer any two questions.**

Note: **Mobiles are strictly prohibited**

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| --- | --- | --- | --- | --- |
| **Sl#** | **Question** | **Marks** | **Bloom’s Level** | **CO** |
| 1 | a) Consider 64X64 image whose histogram is given in the table below. Transform this histogram so that it will have the values specified in the 4th column of the table.   |  |  |  |  | | --- | --- | --- | --- | | rk | nk | Pr(rk) | Pz(zq) | | r0=0 | 790 | 0.19 | 0.00 | | r1=1 | 1023 | 0.25 | 0.00 | | r2=2 | 850 | 0.21 | 0.00 | | r1=3 | 656 | 0.16 | 0.15 | | r1=4 | 329 | 0.08 | 0.20 | | r1=5 | 245 | 0.06 | 0.30 | | r1=6 | 122 | 0.03 | 0.20 | | r1=7 | 81 | 0.02 | 0.15 | | 10 | Apply | CO2 |
| b) What is image histogram? Write an algorithm for performing histogram equalization of an image. | 5 | Understand | CO3 |
| 2 | a)Define smoothing spatial filters. Apply the median filter on the given 6X6 image to enhance the quality of image.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 1 | 4 | 0 | 1 | 3 | 1 | | 2 | 2 | 4 | 2 | 2 | 3 | | 1 | 0 | 1 | 0 | 1 | 0 | | 1 | 2 | 1 | 0 | 2 | 2 | | 2 | 5 | 3 | 1 | 2 | 5 | | 1 | 1 | 4 | 2 | 3 | 0 | | 10 | Apply | CO2 |
| b)Explain the mechanics of spatial filtering. Write the procedure for image sharpening using high boost filtering. | 5 | Understand | CO3 |
| 3 | a) Consider the image matrix given below: | 10 | Apply | CO2 |
| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 128 | 128 | 128 | 64 | 64 | 32 | 32 | 8 | | 64 | 64 | 128 | 128 | 128 | 8 | 32 | 32 | | 32 | 8 | 64 | 128 | 128 | 64 | 64 | 64 | | 8 | 128 | 128 | 64 | 64 | 8 | 64 | 64 | | 128 | 64 | 64 | 64 | 128 | 128 | 8 | 8 | | 64 | 64 | 64 | 128 | 128 | 128 | 32 | 32 | | 8 | 128 | 32 | 64 | 64 | 128 | 128 | 128 | | 8 | 8 | 64 | 64 | 128 | 128 | 64 | 64 |   Select the threshold and perform Global threshold based segmentation on the above image. Show the output matrix. |  |  |  |
|  | b)Write an algorithm for region growing segmentation. Highlight its benefits and drawbacks. | 5 | Understand | CO3 |