Reg. No. :

Question Paper Code: 49502

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Electronics and Communication Engineering

14UEI902-PRINCIPLES OF DIGITAL IMAGE PROCESSING

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. Images quantized with insufficient brightness levels will lead to   CO1- R
   the occurrence of _____

   (a) Pixillation   (b) Blurring   (c) False Contours   (d) Sampling

2. In an image accentuating a specific range is called   CO1- R

   (a) slicing   (b) color slicing   (c) cutting   (d)color enhancement

3. Identify the tool used in tasks such as zooming, shrinking,   CO2- R
   rotating, etc.

   (a) Sampling   (b) Interpolation

   (c) Filters   (d) Rasterisation

4. A_____achieves smoothing comparable to the arithmetic mean   CO2- R
   filter, but it tends to lose less image detail in the process.

   (a) Arithmetic mean filter   (b) geometric mean filter

   (c) spatial filter   (d) none of above

5. Restoration cannot be done using   CO3- R

   (a) single projection   (b) double projection

   (c) triple projection   (d) octa projection

6. In wiener filtering it is assumed that noise and image are   CO3- R

   (a) different   (b) homogeneous   (c) uncorrelated   (d) correlated

7. One that is not a method of image segmentation is   CO4- R

   (a) area   (b) line   (c) point   (d) edge

8. The threshold used for each pixel depends on the location of the   CO4- R
   pixel in terms of the sub images, this type of thresholding is _____

   (a) adaptive   (b) static   (c) modern   (d) one of above

9. Shannons theorem is also called   CO5- R

   (a) noiseless coding theorem   (b) noisy coding theorem

   (c) coding theorem   (d) noiseless theorem

10. Encoder is used for   CO5- R

    (a) image enhancement   (b) image decompression

    (c) image compression   (d) image equalization

PART – B (5 x 2= 10Marks)

11. Indicate the different transforms used in DIP.   CO1- R

12. Differentiate between Geometric mean and Harmonic mean.   CO2- R

13. Define Image Restoration.   CO3- R

14. Define region growing.   CO4- R

15. List the need for Compression.   CO5- R

PART – C (5 x 16= 80Marks)

16. (a) (i) Illustrate the elements of digital image processing systems.   CO1 -U   (8)

         (ii) State and explain the working principles Vidicon and Digital CO1 -U   (8)
         Camera.
                              Or
    (b) Illustrate the RGB colour model and HIS color model in digital   CO1 -U   (16)
         image processing.

17. (a) Define histogram and explain the histogram equalization of image   CO2- U   (16)
         enhancement in detail with equations.
                              Or
    (b) Describe how homomorphic filtering is used to separate   CO2 -U   (16)
         illumination and reflectance component.

18. (a) Illustrate constrained least square filtering for image restoration CO3 -U (16)
         and derive its transfer function.

2

49502

(b) Point out the steps involved in geometric transformation and spatial transformation in detail. CO3 -U (16)

19. (a) Examine region based segmentation and region growing with an example. CO4 -U (16)

Or

(b) Explain the process of dam construction along with the watershed segmentation algorithm. CO4- U (16)

20. (a) Determine the Huffman code assignment procedure for the following data: CO5- U (16)

Symbol	Probability
a1	0.1
a2	0.4
a3	0.06
a4	0.1
a5	0.04
a6	0.3

Compute the average length of the code and the entropy of the source. Huffman code uniquely decodable? If so, Justify your answer.

Or

(b) Discuss about MPEG standard and compare with JPEG. CO5 -U (16)

49502

49502