Register No.: ..... Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), MAY 2023

ROBOTICS AND AUTOMATION

(2021 Scheme)

Course Code: 21RA205-A

Course Name: Digital Image Processing and Computer Vision

Max. Marks: 60 **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Explain about any 2 transforms and also write their importance.
2. What is Histogram processing.
3. What is sampling?
4. Explain a Compression technique in which data is not lost.
5. What are the advantages of JPEG2000 over JPEG?
6. Explain a method that removes pixels from object boundaries.
7. Explain the binary morphological operation that can be used to look for particular patterns of foreground and background pixels in an image.
8. Explain the matrix for calculating the spatial relationship of an image pixel.

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. Explain KL transform? What are its disadvantages? (6)

OR

10. With an example explain the Haar transform. (6)

MODULE II

11. Explain any two techniques for sharpening an image. (6)

OR

12. Explain the modelling of a filter as the product of illumination and reflectance function. (6)

MODULE III

13. What are the different image compression techniques? Explain. (6)

OR

14. What are the different algorithms used for partitioning image using similar data into a cluster? Explain. (6)

MODULE IV

15. Identify a filter that can be used to filter out the noise from the corrupted signal to provide an estimate of the underlying signal of interest. Explain in detail. (6)

OR

16. Explain a computational technique of increasing the resolution and signal to noise ratio of images captured on an imaging system. (6)

MODULE V

17. Explain thinning and shape decomposition. (6)

OR

18. Explain a method to probe an image with a simple, pre-defined shape, drawing conclusions on how this shape fits or misses the shapes in the image. (6)

MODULE VI

19. With a block schematic explain parallel beam projection. (6)

OR

20. Explain different measures of textures. How do they contribute in texture analysis. (6)

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