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Question Paper Code : 72044

31/05/2017 FN

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Sixth/Seventh Semester

Information Technology

IT 6005 — DIGITAL IMAGE PROCESSING

(Common to Biomedical Engineering, Computer Science and Engineering, Electronics and Communication Engineering, Instrumentation and Control Engineering, Mechatronics Engineering, Medical Electronics, Electronics and Instrumentation Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. When is fine sampling and coarse sampling used?
2. What is the function of an image sensor?
3. Differentiate between image enhancement and restoration.
4. If all the pixels in an image are shuffled, will there be any change in the histogram? Justify your answer.
5. Why the restoration is called as unconstrained restoration?
6. Define region growing.
7. What is run length coding?
8. What are the operations performed by error free compression?
9. Does the use of chain code compress the description information of an object contour?
10. What is meant by pattern classes?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the components of image processing system.

Or

- (b) (i) Discuss the effects of non uniform sampling and quantization. (8)
(ii) Explain how color images are represented using HSI color space model. (8)

12. (a) Explain the various enhancement techniques performed in spatial domain.

Or

- (b) If a low pass filter is formed that averages the 4-neighbours of a point (x, y) but excludes point (x, y) itself. Find the equivalent filter function $H(u, v)$ in the frequency domain. Show that it is a low pass filter.

13. (a) Derive a Wiener filter for image restoration and specify its advantages over inverse filter.

Or

- (b) Explain region splitting and merging technique for image segmentation with suitable examples.

14. (a) With a neat block diagram, explain transform based Image compression scheme. Also give two valid reasons for the choice of "Discrete Cosine Transform" in JPEG image compression standard.

Or

- (b) Encode the sentence 'I LOVE IMAGE PROCESSING' using arithmetic coding procedure.

15. (a) Explain in detail about the object recognition techniques based on matching.

Or

- (b) Explain the various boundary descriptors in detail with a neat diagram.