Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : X 60411

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

Seventh/Eighth Semester

Electronics and Communication Engineering

EC 2029/EC 708/10144 ECE 41 – DIGITAL IMAGE PROCESSING

[Common to Electronics and Instrumentation Engineering]

(Regulations 2008/2010)

[Also Common to PTEC 2029 – Digital Image Processing for B.E. (Part-Time)

Seventh Semester – ECE – Regulations 2009]

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   **(10×2=20 Marks)**

1. How do you relate contrast and brightness ?

2. Write the kernel and applications of KLT.

3. What are the types of image enhancement available ?

4. Mention the procedure involved in marker selection.

5. Compare constrained and unconstrained Restoration.

6. What is the principle of Inverse filtering ?

7. Mention two applications of image segmentation techniques.

8. Write the importance of Edge detection.

9. State the optimality conditions for Huffman code.

10. State the need for data compression.

PART – B   **(5×16=80 Marks)**

11. a) State and prove convolution property of 2D – FFT.   **(16)**

(OR)

b) Determine the DCT matrix for N = 4.   **(16)**

12. a) Describe histogram equalization. Obtain Histogram equalization for the following image segment of size 5 × 5. Write the inference on image segment before and after equalization. **(16)**

$$
\begin{array}{ccccc}
20 & 20 & 20 & 18 & 16 \\
15 & 15 & 16 & 18 & 15 \\
15 & 15 & 19 & 15 & 17 \\
16 & 17 & 19 & 18 & 16 \\
20 & 18 & 17 & 20 & 15
\end{array}
$$
(5 × 5) matrix

(OR)

b) i) Describe how homomorphic filtering is used to separate illumination and reflectance component ? **(8)**

ii) How mean filters are used for image enhancement ? **(8)**

13. a) i) What is gray-level interpolation ? Explain the schemes involved in it. **(8)**

ii) Differentiate constrained and unconstrained restoration. **(8)**

(OR)

b) Write notes on :
i) Inverse filtering. **(8)**
ii) Least square error filter. **(8)**

14. a) How do you perform edge defection ? Give suitable algorithm and discuss how the edge points are linked ?

(OR)

b) Discuss how
i) Region growing. **(6)**
ii) Region splitting and merging approaches are used for image segmentation. **(10)**

15. a) i) What is the need for Date Compression ? **(6)**
ii) Explain in detail about the arithmetic Coding. **(10)**

(OR)

b) Write short notes on the following image Codings :
i) JPEG standard **(4)**
ii) MPEG **(4)**
iii) Transform coding. **(8)**

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