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T.E. (E&TC)

DIGITAL IMAGE PROCESSING

(2019 Pattern) (Semester-II) (Elective - II) (304195)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) *Neat diagrams must be drawn wherever necessary.*
2) *Figures to the right indicate full marks.*
3) *Your answers will be valued as a whole.*
4) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
5) *Assume suitable data, if necessary.*

Q1) a) What is edge detection? Compare performance of first order & second order derivative w.r.t. image. **[6]**

b) Explain Laplacian edge detector. Explain Why LoG mask is preferred over Laplacian edge detector. **[6]**

c) What is Hough Transform? How it is used in edge linking. **[6]**

OR

Q2) a) Explain local and global thresholding in image segmentation. **[6]**

b) Explain the image segmentation using **[6]**

i) Region splitting   ii) Region merging

c) Explain the following edge detecting operators in detail. **[6]**

i) Prewitt operator   ii) Sobel operator

Q3) a) Explain the need of image compression. Hence explain image compression model. **[6]**

b) Explain the concept of motion estimation with the help of any one algorithm in detail. **[6]**

c) What is data redundancy? Explain the two redundancies used in image compression. **[5]**

OR

P.T.O.

Q4) a) What is lossy compression technique? Explain the DCT based compression technique. **[6]**

b) Draw and explain JPEG base line encoder. Comment on block size used in JPEG. **[6]**

c) What is fidelity Criteria? Explain the fidelity criteria used in image compression. **[5]**

Q5) a) What is image restoration? How image restoration is different from image enhancement explain with example? **[6]**

b) Explain any three types of noise models. **[6]**

c) Explain in detail how Weiner filter is used in image restoration. **[6]**

OR

Q6) a) Explain any three Geometric transforms in image restoration. **[6]**

b) Explain in detail constrained least square filtering. **[6]**

c) Explain the estimation of degradation function in frequency domain. **[6]**

Q7) a) What is pattern in images? Explain the different pattern classes in object recognition. **[6]**

b) What is image classification? How it is used for object recognition. **[6]**

c) How Deep learning using CNN is used for object recognition. **[5]**

OR

Q8) a) Explain any one algorithm of content based image retrival. **[6]**

b) Explain any one algorithm of image classification in detail. **[6]**

c) Explain object recognition using structural methods. **[5]**

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