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C028634(028)

B. Tech. (Sixth Semester) Examination, April-May 2022

(AICTE Scheme)

IMAGE PROCESSING & REMOTE SENSING

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all the questions. Part (a) is compulsory from each unit and attempt any* ***two*** *questions from part (b), (c) and (d).*

Unit-I

1. (a) How to work electromagnetic field energy sources and radiation principles in remote sensing system.   4

(b) Explain about energy interactions with earth surface features and how to work electromagnetic energy with earth surface. 8

(c) Briefly describe about spectral reflectance of earth surface features Types and Spectral reflectance curves. 8

(d) Explain about spectral response patterns and atmospheric influences on spectral response patterns in remote sensing system. 8

Unit-II

2. (a) Explain about Goes satellites, ocean monitoring satellites and earth observing system. 4

(b) Describe about general characteristics of satellite remote sensing systems satellite bus and mission subsystem. 8

(c) How to work Sensor Design Parameters and FWHM in remote sensing system? 8

(d) Explain about resolution systems thematic mapper spectral bands and show the TM band colour combination. 8

Unit-III

3. (a) What is element of Digital Geometry and derive it some important definitions. 4

(b) What is Restoration in image processing? How to estimate Minimum mean-square Error Restoration and Least-square Error Restoration. 8

(c) Describe about Ground reflectance information in earth surface form restoration. 8

(d) Explain about Modern CT systems used a fan-beam geometry. 8

Unit-IV

4. (a) How to used Homomórphic filtering in image Enhancement. 4

(b) Explain about Image Enhancement. How to work in contrast intensification where linear stretching and nonlinear stretching in image enhancement? 8

(c) Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at the pixel. Hence the whole array

represent a digital image $g\,(r, c)$ of size 5×5. The centre pixel $g\,(2, 2)$ is marked by underline   8

0	1	0	6	7
2	0	1	6	5
1	1	<u>7</u>	5	6
1	0	6	6	5
2	5	6	7	6

(d) Explain the Edge-preserving smoothing with standard deviation in image enhancement.   8

Unit-V

5. (a) Describe about advantages and disadvantages of supervised and unsupervised classification.   4

(b) Explain about Supervised and Unsupervised classi-fication form information extraction.   8

(c) Use basic mathematical expression in fuzzy set and its properties.   8

(d) What is the process of Image Extraction using Principal Component Analysis (PCA)?   8