2023

Advanced Digital Image Processing

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.		**Answer the following questions:**	
	a)	Discuss about the analog and digital images.	3
	b)	Write down the map features with examples and in terms of geographical coordinate.	6
	c)	Write down the details of LANDSAT-TM all BANDS with the corresponding wavelength, spectral and spatial resolutions. Mention the additional BAND in LANDSAT-ETM+ which differentiate with LANDSAT 4 & 5.	7
	d)	Write down the digital image processing advantages which are the disadvantages in visual image interpretation.	4
2.	**a)**	Write down the earth observation satellites and describe the used sensors in Cartosat-1 & 2 details (spectral & spatial resolution) and applications.	4
	b)	Describe the hyperspectral remote sensing with hyperspectral image analysis, Derivative analysis and Atmospheric Correction.	8
	c)	Describe the problem of mixed pixels in short using a diagram.	3
	d)	Explain the linear mixture model for soft classifiaction.	5
3.	**a)**	What is accuracy assessment of classification?	3
	b)	Explain all the different measures for Accuracy Assessment with the formulations.	5
	c)	Explain the SVM with its different scenarios.	4
	d)	What are the four tuning parameters of SVM classifier?	8
4.	**a)**	Why image fusion is needed in satellite images?	4
	b)	What are the usages of image fusion?	4
	c)	What are the image fusion approaches?	4
	d)	Explain the pixel based fusion approaches.	4
	e)	What is supervised classification? Write down its related methods?	4
5.		Write short notes on the following (any four):	4x5=20
	a)	Backpropagation neural network	
	b)	ASD SpectroRadiometer	
	c)	Smoothing filter	
	d)	Sharpening filter	

	e)	LULC classification scheme for CIT Kokrajhar	
6.		Differentiate between the following (any four):	4x5=20
	a)	Parametric and Non-parametric classification techniques	
	b)	Physical modelling and Empirical Modeling	
	c)	Active and Passive sensor	
	d)	high resolution and Medium resolution satellite systems and their sensors	
	e)	Convolution and Correlation	