

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS:** M.Sc / Pre-PhD  
**BRANCH:** Geoinformatics

**SEMESTER :** II/NA  
**SESSION :** SP-2023

**SUBJECT: GI509R1 DIGITAL SATELLITE IMAGE PROCESSING**

**TIME:** 3 Hours

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Explain the significance of Spectral, Temporal, and Radiometric resolution in crop phenological studies.	[6] 1	5
Q.1(b)	Describe the process of georeferencing of the satellite images.	[4] 2	4
Q.2(a)	Describe the difference between linear contrast stretching and histogram equalization of satellite images.	[6] 3	3
Q.2(b)	Mean low pass filtering is performed on two satellite images of the same area, the first image having a lower radiometric resolution and the second image having a higher radiometric resolution. Explain the difference between the two resultant images produced after applying mean low pass filtering.	[4] 3	5
Q.3(a)	Describe some advantages of Band Ratio technique.	[3] 3	2
Q.3(b)	Write the equation of any three vegetation index in terms of wavelength range. What will be the impact If we replace Red band by Green band in NDVI?	[3] 3	3
Q.3(c)	What is the pre-requisite for performing change detection analysis? What will be the temporal resolution for climate change analysis and diurnal change of temperature.	[4] 3	4
Q.4(a)	Discuss the K-means unsupervised clustering technique.	[6] 4	3
Q.4(b)	What is the minimum number of band(s) required to perform Parallelepiped and Maximum Likelihood classifiers, respectively? Justify your answer with suitable reasons.	[4] 4	5
Q.5(a)	What is more important in context of identifying uniqueness of any feature, absorption capability or its reflection capability? Justify your answer.	[2] 5	3
Q.5(b)	Differentiate hyperspectral and multispectral Remote Sensing.	[4] 5	4
Q.5(c)	What is the wavelength range of microwave remote sensing? Describe some of the advantages of microwave remote sensing over optical remote sensing?	[4] 5	3

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