

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

**CLASS: M.TECH/PRE-PHD
BRANCH: REMOTE SENSING**

**SEMESTER : II/NA
SESSION : SP/19**

**SUBJECT: RS512 ADVANCED REMOTE SENSING AND GEOSPATIAL MODELLING
TIME: 3.00 Hrs.**

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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- Q.1(a) Illustrate with a diagram the SAR imaging geometry. [5]
Q.1(b) List the factors that affect SAR backscattering. What will be the backscattering - high or low from following surface features: i) Smooth water surfaces ii) Rough water surface urban iii) Vegetation iv) Dry soil v) Moist soil [5]

- Q.2(a) What is Hyperspectral imaging? How it is different from Multi-spectral imaging? [5]
Q.2(b) i) Why pre-processing is critical in Hyperspectral Remote sensing. Write some of the pre-processing techniques. [5]
ii) How Hyperspectral imaging is useful in vegetation species identification? Explain the basis.

- Q.3(a) What do you mean by point pattern analysis? Explain three different point pattern analysis methods. [5]
Q.3(b) i) Differentiate position uncertainty and attribute uncertainty. [5]
ii) How will you quantify additive and multiplicative error? Explain with example.

- Q.4(a) i) What are the elements of MCDM technique. [5]
ii) Calculate the criteria weights using PCM technique for the given table and check its consistency.

	C1	C2	C3
C1	1	3	5
C2		1	3
C3			1

- Q.4(b) i) Why time-series satellite data is important for climate change studies? [5]
ii) Explain about various information you can derive using time-series analysis.

- Q.5(a) i) What do you mean by Web GIS? How it is different from Internet GIS? [5]
ii) Explain the following terminologies: WMS, WCS, WFS

- Q.5(b) i) Explain three different protocols being currently used in Internet GIS? [5]
ii) Explain the following terminologies: KML, Geoserver, Bhuvan