

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

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

**SEMESTER : I  
SESSION : MO/2025**

**SUBJECT: RS501 PRINCIPLES OF REMOTE SENSING AND 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)	Diagrammatically explain the vegetation response curve.	[5] 1	2
Q.1(b)	Why does vegetation appear red in a FCC?	[5] 1	3
Q.2(a)	Using suitable examples discuss the types of sensor specification for Indian satellites.	[5] 2	2
Q.2(b)	Discuss with examples the roles of weather and communication satellites.	[5] 2	2
Q.3(a)	How does surface roughness affect polarization?	[5] 3	3
Q.3(b)	Explain the concepts of Radar Geometry, using suitable diagram.	[5] 3	3
Q.4(a)	Explain the formation of gray-level images and standard FCC based on the concept of Color Look-up Table (LUT). Consider a display device with a 3-bit color resolution for a multispectral image with three spectral bands (Green, Red, and Near Infrared) and a 3-bit radiometric resolution.	[5] 3	5
Q.4(b)	Describe linear and non-linear contrast stretching.	[5] 3	3
Q.5(a)	Describe k-means clustering.	[5] 4	3
Q.5(b)	Write the minimum number of spectral bands required to perform (i) k-means clustering, and (ii) parallelepiped classifier, respectively.	[5] 4	5

Give suitable reasons for your answer.

:19/11/2025:E