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

CLASS: M.TECH/PRE-PHD **SEMESTER : I**
BRANCH: Remote Sensing **SESSION :MO/2023**

SUBJECT: RS501 PRINCIPLES OF REMOTE SENSING & 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.

			CO	BL
Q.1(a)	How does electromagnetic radiation help in the process of Remote sensing?	[3]	[CO1]	[BL2]
Q.1(b)	Explain any two kinds of resolutions with proper examples.	[2]	[CO1]	[BL1]
Q.1(c)	What is the energy balance equation? How is it used in the discipline of Remote Sensing?	[5]	[CO1]	[BL3]
Q.2(a)	Write the difference between the whiskbroom and push broom sensors.	[4]	[CO2]	[BL4]
Q.2(b)	What is the major difference between the optical and microwave sensors?	[4]	[CO2]	[BL2]
Q.2(c)	Give the resolution of any IRS sensor.	[2]	[CO2]	[BL1]
Q.3(a)	Give an exhaustive classification of active and passive sensors.	[2]	[CO3]	[BL2]
Q.3(b)	Write down the difference between: (i) Imaging and Non-Imaging sensors (ii) Azimuth Direction and Range Direction. (iii) Thermal Capacity and Thermal Conductivity.	[6]	[CO3]	[BL1]
Q.3(c)	In a synthetic aperture radar system, a pulse is for a duration of 0.2 microsecond, depression angle is 23°, what will be the ground resolution?	[2]	[CO3]	[BL3]
Q.4(a)	Explain the formation of gray-level images and standard FCC on a display device with a 3-bit color resolution for a multispectral image with three bands (Green, Red, and Near Infrared) and a 3-bit radiometric resolution based on the concept of Color Look-up Table.	[5]	[CO3]	[BL5]
Q.4(b)	Describe the difference between horizontal, vertical, and diagonal high-pass filters with one example from each.	[5]	[CO3]	[BL4]
Q.5(a)	Describe k-means clustering and its advantages and disadvantages.	[4]	[CO4]	[BL4]
Q.5(b)	Write the minimum number of bands required to perform (i) k-means clustering, (ii) parallelepiped classifier, and (iii) maximum likelihood classifier, respectively. Give suitable reasons for your answer.	[2+2+2]	[CO4]	[BL5]

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