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

CLASS: M.Sc / IMSc. **SEMESTER : II/VIII**
BRANCH: MGI/BT/IMH/ICH **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.

		Marks	CO	BL
Q.1(a)	What do resolutions mean in Remote Sensing images? Explain any one of them.	[2]	1	2
Q.1(b)	When are Geometric corrections required for Remote Sensing images? Explain.	[3]	2	3
Q.2(c)	Given a satellite digital data below: represent this in BIP format	[5]	1	3

Band1			Band2			Band3		
22	23	55	16	24	33	33	52	61
23	45	33	14	23	45	14	25	22
15	20	44	52	33	18	13	22	33

Q.2(a)	Explain the concept of a standard FCC in RS images						[5]	2	3
Q.2(b)	Apply a 3x3 average filter for the given digital data of the satellite image						[5]	3	3

22	45	66	87	33	44
21	15	12	65	32	23
34	54	65	46	12	45
22	34	25	15	10	05

Kindly rewrite the new corrected matrix after applying the average filter for the encircled values only [CO3,BL3]

Q.3(a)	Describe some advantages of Band Ratio technique.	[3]	3	2
Q.3(b)	Give any example of bad ratio which is used for highlighting either vegetation or water in the satellite image. Write the equation in terms of wavelength range.	[3]	3	3
Q.3(c)	Explain the utility of multi-dated data in remote sensing applications with an example.	[4]	3	4
Q.4(a)	Explain unsupervised Classification?	[2.5]	4	3
Q.4(b)	Compare supervised classification with unsupervised classification.	[2.5]	4	3
Q.4(c)	Calculate the overall accuracy, errors of commission, Errors of Omission, Producers Accuracy and user accuracy for the following confusion matrix/error matrix	[5]	4	3

	Asphalt	Concrete	Grass	Tree	Building	Total
Asphalt	2385	4	0	1	4	2394
Concrete	0	332	0	0	1	333
Grass	0	1	908	8	0	917
Tree	0	0	0	1084	9	1093
Building	12	0	0	6	2053	2071
Total	2397	337	908	1099	2067	6808

Q.5(a)	Differentiate hyperspectral and multispectral Remote Sensing.	[4]	5	3
Q.5(b)	What is the wavelength range of microwave remote sensing? Describe some of the advantages of microwave remote sensing over optical remote sensing?	[6]	5	3

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