



<b>Name:</b>  <b>Enrolment No:</b>	
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**UPES**  
**End Semester Examination, May 2024**

<b>Course: RS and GIS applications in Geosciences</b> <b>Program: B.Sc Geology</b> <b>Course Code: PEGS 3061</b>	<b>Semester: VI</b> <b>Time : 03 hrs</b> <b>Max. Marks: 100</b>
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**SECTION A**  
**(5Qx4M=20Marks)**

Q 1	a) What effect does increase in soil moisture content has on the spectral reflectance curve?		
	b) The color of turbid water appears brownish red in an optical satellite image while clear water appears dark-bluish. Explain why this is so in terms of spectral reflectance curve.	<b>2X2=04</b>	<b>CO1</b>
Q 2	Describe the x, y, and z parameters of a digital image.	<b>04</b>	<b>CO2</b>
Q 3	Comment on how fuzzy logic caters to imprecision in the classification process.	<b>04</b>	<b>CO3</b>
Q 4	Define an AM/FM system and list its important parameters.	<b>04</b>	<b>CO4</b>
Q 5	Differentiate between a thin and thick client.	<b>2X2=04</b>	<b>CO4</b>

**SECTION B**  
**(4Qx10M= 40 Marks)**

Q 6	Differentiate between supervised and unsupervised classification and explain the advantages and disadvantages of both types.	<b>10</b>																																																																							
	<b>OR</b>																																																																								
	a) What is the importance of Error Matrix and describe the different types of accuracies with simple calculations. b) Given below is a Contingency table for different classes. <ol style="list-style-type: none"> <li>i. Calculate the Producers Accuracy for Forest.</li> <li>ii. Calculate the User's Accuracy for Corn.</li> <li>iii. Calculate the Overall Accuracy.</li> </ol>	<b>5+5=10</b>	<b>CO3</b>																																																																						
	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Classified Data</th> <th colspan="6">Reference Data</th> <th rowspan="2">Row Total</th> </tr> <tr> <th>Water</th> <th>Sand</th> <th>Forest</th> <th>Urban</th> <th>Corn</th> <th>Hay</th> </tr> </thead> <tbody> <tr> <td>Water</td> <td>480</td> <td>0</td> <td>5</td> <td>0</td> <td>0</td> <td>0</td> <td>485</td> </tr> <tr> <td>Sand</td> <td>0</td> <td>52</td> <td>0</td> <td>20</td> <td>0</td> <td>0</td> <td>72</td> </tr> <tr> <td>Forest</td> <td>0</td> <td>0</td> <td>313</td> <td>40</td> <td>0</td> <td>0</td> <td>353</td> </tr> <tr> <td>Urban</td> <td>0</td> <td>16</td> <td>0</td> <td>126</td> <td>0</td> <td>0</td> <td>142</td> </tr> <tr> <td>Corn</td> <td>0</td> <td>0</td> <td>0</td> <td>38</td> <td>342</td> <td>79</td> <td>459</td> </tr> <tr> <td>Hay</td> <td>0</td> <td>0</td> <td>38</td> <td>24</td> <td>60</td> <td>359</td> <td>481</td> </tr> <tr> <td>Col Total</td> <td>480</td> <td>68</td> <td>356</td> <td>248</td> <td>402</td> <td>438</td> <td>1992</td> </tr> </tbody> </table>	Classified Data	Reference Data						Row Total	Water	Sand	Forest	Urban	Corn	Hay	Water	480	0	5	0	0	0	485	Sand	0	52	0	20	0	0	72	Forest	0	0	313	40	0	0	353	Urban	0	16	0	126	0	0	142	Corn	0	0	0	38	342	79	459	Hay	0	0	38	24	60	359	481	Col Total	480	68	356	248	402	438	1992		
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Q 7	a) If you wanted to monitor the general health of all vegetation covers over the Indian states for several months, what type of platform and sensor characteristics (spatial, spectral, and temporal resolution) would be best for this and why?	<b>5+5=10</b>	<b>CO1</b>
	b) Enumerate the causes of radiometric and geometric distortions in satellite imagery.		
Q 8	Explain the following image enhancement techniques. i) Edge Enhancement ii) Principal component analysis	<b>5+5=10</b>	<b>CO2</b>
Q 9	Comment with reasonable example, why you would use fuzzy logic in site suitability selection as opposed to traditional Boolean overlay methods.	<b>10</b>	<b>CO3</b>
<b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b>			
Q 10	a) Describe the standard workflow for Fuzzy logic in a spatial analysis problem.	<b>10</b>	<b>CO4</b>
	b) Explain the different Fuzzy Membership types.	<b>10</b>	
	<b>OR</b>		
	Discuss the key differences between an AM, FM and AM/FM/GIS systems with diagrams.	<b>20</b>	
Q 11	Explain the advantages and disadvantages of both Server-side and Client-side strategies in Internet GIS. With a suitable diagram describe the system architecture of WebGIS.	<b>10+10</b> <b>=20</b>	<b>CO4</b>