

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2018

Course: PEGI – 3004: Hyperspectral Remote Sensing
Program: B. Tech. GIE
Time: 03 hrs.

Semester: VI
Max. Marks: 100

Instructions:

SECTION A

Answer all Questions

S. No.		Marks	CO
Q 1	List various assumptions in the hyperspectral reflectance field spectroscopy	4	CO1
Q2	Write brief note on red edge parameters	4	CO2
Q3	With schematic diagram explain the approaches of spectral ratio indices computation	4	CO2
Q4	Write short note with empirical relationship the concept of SAM technique of HRS data analysis	4	CO3
Q5	List four each vegetation structural and biochemical parameters assessing hyperspectral vegetation indices	4	CO3

SECTION B

Q6	Give detail account of MMF transform method of hyperspectral RS data analysis	10	CO3
Q7	List nine types of techniques / methods used for hyperspectral RS data applications in vegetation and discuss analysis approaches used in the techniques of vegetation species discrimination and mapping	4 + 6	CO4
Q8	Write note on spectral characteristics of soils and methods of soil salinity assessment using hyperspectral RS data	5 + 5	CO4
Q9	Discuss the needs of field spectroscopy in hyperspectral remote sensing and principle of field spectroscopy	5 +5	CO1
OR			
	Given an account of analysis approaches used in the applications of hyperspectral remote sensing in coastal environments and inland waters	10	CO4

SECTION-C

Q10	Discuss in details – concept of spectral unmixing analysis of hyperspectral RS data and factors causing mixing of materials in nature, and MESMA and MTMF spectral unmixing analysis techniques.	5+5+ 10	CO3
Q11	Write in details various methods used for extracting the red edge vegetation spectral parameters from hyperspectral RS data	20	CO4
OR			
	Give an detail account of approaches of use of spectral absorption features techniques for mineral mapping utilizing hyperspectral RS data	20	CO4

Name:

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SECTION A

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S. No.		Marks	CO
Q 1	Write short note with diagram the concept of SVM method of digital classification of hyperspectral RS data	4	CO3
Q2	Give empirical relationships of four ASTER satellite ratio indices for Identification of mineral assemblages	4	CO4
Q3	Write brief note on four roles of field spectroscopy in hyperspectral remote sensing	4	CO1
Q4	Write short note on spectral derivative analysis of hyperspectral RS data and uses of this technique	4	CO2
Q5	Explain with diagram and empirical relationship – spectral absorption index	4	CO3
SECTION B			
Q6	Give a detail account of spectral absorption characteristics of minerals and rocks caused by the electronic processes	10	CO4
Q7	Write the advantages of dimensionality reduction of hyperspectral RS data and discuss in detail one method of dimensionality reduction of hyperspectral RS data	4 + 6	CO2
Q8	Write in details (diagram and empirical relationship) the SAM method of analysis of hyperspectral satellite data and its use in natural resources mapping	10	CO3
Q9	Write notes on various analysis approaches adopted for the use of hyperspectral RS data in assessment of environmental hazards and disasters	10	CO4
	Or		
	Discuss the various methods used for estimation of soil organic carbon and soil organic matter content using hyperspectral RS data	10	CO4
SECTION-C			
Q10	Write in details analysis approaches of estimation of various types of vegetation biochemical parameters using hyperspectral RS data	20	CO4
Q11	Discuss in detail various spectral similarity measures used in hyperspectral RS data analysis	20	CO3
	Or		
	Write the concept of spectral unmixing analysis techniques. Give detail accounts of various methods of spectral unmixing techniques used for mineral mapping using hyperspectral RS data	20	