

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, December, 2020

Course: Applications of Geoinformatics
Program: B. Tech. GIE
Course Code: PEGI 4002P
No. of pages: 3

Semester: VII
Time 03 hrs.
Max. Marks: 100

SECTION A

S. No.	Instruction: Each sub question under main question carry one mark.	Marks	CO
Q 1	<p>True or False</p> <p>a. The NDWI hyperspectral index is generally used detect hydrocarbon micro-seepage induced vegetation stress.</p> <p>b. Oil has higher thermal conductivity than reservoir rocks.</p> <p>c. Sandstone landscape is dominated by dendritic drainage.</p> <p>d. The flatirons develop wherever interbedding of hard and soft rocks exists.</p> <p>e. GLOF is a hydrological disaster.</p>	5	CO1
Q2	<p>Multiple choice with single answer</p> <p>a. Marble dominated landscape, generally show _____ drainage density. (i) Fine; (ii) High; (iii) Course; (iv) Moderate.</p> <p>b. The _____ drainage pattern is developed in a narrow valley flanked by steep ranges. (i) Trellised; (ii) Dendritic; (iii) Pinnate; (iv) Annular.</p> <p>c. Sulphate has characteristics spectral absorption feature in _____ spectral region. (i) MIR; (ii) SWIR; (iii) Visible; (iv) TIR.</p> <p>d. A long sloping surface opposed by an escarpment is called _____. (i) Plunging fold; (ii) Inclined bed; (iii) Strike ridge; (iv) Cuesta</p> <p>e. Hydrocarbon bearing materials show characteristics absorption features in _____ spectral region (i) TIR; (ii) SWIR, (iii) MIR; (iv) NIR.</p>	5	CO2
Q3	<p>Multiple choice with single answer</p> <p>a. The _____ spectral index is used for discriminating snow and ice from ice mixed debris. (i) NDSI; (ii) NDGI; (iii) S3; (iv) NDSI – I.</p> <p>b. Oil spill in sea create _____ degree temperature difference compare to no oil spill sea water temperature. (i) 2; (ii) 1.5; (iii) 3; (iv) 2.5.</p>	5	CO3

	<p>c. For discrimination of cereal and fodder crop _____ band RS data preferred. (i) SWIR; (ii) MIR; (iii) Visible, (iv) NIR.</p> <p>d. For regular monitoring of SST, the microwave imager satellite having _____GHz frequency is very useful. (i) 10.3; (ii) 9.5; (iii) 10.7; (iv) 9.8.</p> <p>e. The _____ is used for exploration of tin deposit. (i) Prophyry; (ii) Gerisen; (iii) Pegmatities; (iv) Placer</p>		
Q4	<p>True or False</p> <p>a. Increase in pore water pressure, increases shear strength of rock. (F)</p> <p>b. Lidar data is effective in mapping landslide under forested areas in hilly region. (T)</p> <p>c. MODIS derived SASI, the slope parameter is computed by using Euclidean distance between at reflectance at NIR and SWIR1 (F)</p> <p>d. Soil types and phases information are available from RS derived soil map at 1: 10,000 scale (F).</p> <p>e. CRYOSAT with InSAR sensor data is use for monitoring ice thickness related to climate change study (T).</p>	5	CO3
Q5	<p>Multiple choice with single answer</p> <p>a. MOPITT sensor of ENVISAT satellite measures (i) CO₂; (ii) CH₄; (iii) NO₂; (iv) CO</p> <p>b. What type of image processing algorithm is use for forest fire detection in INFFRAS system of India utilizing MODIS satellite data? (i) Image regression; (ii) SVM; (iii) Contextual; (iv) Spectral unmixing;</p> <p>c. AFL remote sensing data detect object based on (i) Reflectance; (ii) Scattering; (iii) Fluorescence; (iv) Emission</p> <p>d. NTI index is computed using MODIS two bands viz. (i) R22 and R30; (ii) R 22 and R32; (iii) R21 and R32; (iv) R22 and 33.</p> <p>e. Gramm – Schmidt (GS) digital change detection which type change detection method? (i) Pixel level; (ii) Feature level; (iii) Object level; (iv) Image Karnel level</p>	5	CO 4
Q6	<p>True or False</p> <p>a. 1:2000 scale underground assets survey map was used in NUIS.</p> <p>b. Master plan map is not part of perspectives plan.</p> <p>c. INSAT-3D sounder data can be used for atmospheric nirogen dioxide content assessment.</p> <p>d. There are 50 ECVs can be derived from remote sensing data.</p> <p>e. In dryland agricultural area, NDVI is commonly used for crop monitoring.</p>	5	CO 3

SECTION B			
	Instructions: Write short notes / Describe briefly		
Q 7	Write the approaches of use of hyperspectral RS technique in hydrocarbon exploration	10	CO2
Q 8	Write the RS derived image and terrain characteristics used for identification of sedimentary rock shale. Which are the cations, anions and chemical constituents of rocks give characteristics absorptions in SWIR and TIR regions of EMR.	5 + 5	CO1
Q 9	Briefly discuss various RS & GIS based crop yield prediction models. Write short note on RS & GIS based integrated crop yield model.	5 + 5	CO3
Q 10	List RS derived indicators used for irrigation system performance evaluation. Give a brief account on rainfall - runoff modeling using SCS method utilizing RS inputs and GIS.	5 + 5	CO3
Q 11	List various methods of digital LULC change analysis using RS data. Briefly discuss the approach of change vector method of LULC change detection.	10	CO3
SECTION-C			
Q12	Instruction: Attempt any one question		
	Discuss in details the approaches of RS based techniques for global monitoring and early warning of volcanic eruption.	20	CO 4
	OR		
	Discuss in details Remote Sensing based approaches of neo-tectonic evidences used for seismic hazard zonation. Give an account of techniques of subsurface coal fire detection using Remote Sensing data.	10 + 10	CO 4