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

Course: Spatial Data Analysis and Modeling (GIEG 324)　　　　　　Semester: VI
Program: B.Tech. CSE OGI
Time: 03 hrs.　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 100

Instructions: Answer all questions from Section A. There are internal choice in Section B and Section C.

SECTION A

S. No.		Marks	CO
Q 1	Explain Modifiable Areal Unit Problem.	5	CO1
Q 2	Describe how one can use the validation technique for comparing different interpolation techniques.	5	CO4
Q 3	Explain overshoot and undershoot in case of spatial data editing with proper diagram.	5	CO7
Q 4	Define Data Precision and Fuzzy Tolerance.	5	CO6

SECTION B

Q 5	What do you mean by location errors. Explain about locational errors using primary data source and secondary data source. Describe the causes for Digitizing Errors.	10	CO2 CO6
Q 6	i. Explain the Global and Local method of Spatial Interpolation. ii. Write down short note on Thiessen Polygon	10	CO3 CO4
Q 7	i. Describe the factors contribute to the Modifiable Areal Unit Problem? ii. To use the American Society for Photogrammetry and Remote Sensing standards how the Root Mean Square is utilized? Elaborate each component.	10	CO2 CO3
Q 8 (A)	i. Define a Buffer zone. ii. Define silvers from an overlay operation. iii. What does a dissolve operation accomplish, explain with proper diagram.	10	CO1 CO5
OR			
Q 8 (B)	i. Both nearest neighbor analysis and Moran's I can apply to point features. How do they differ in terms of input data? ii. Describe a point-in-polygon overlay operation.	10	CO1 CO5
SECTION-C			

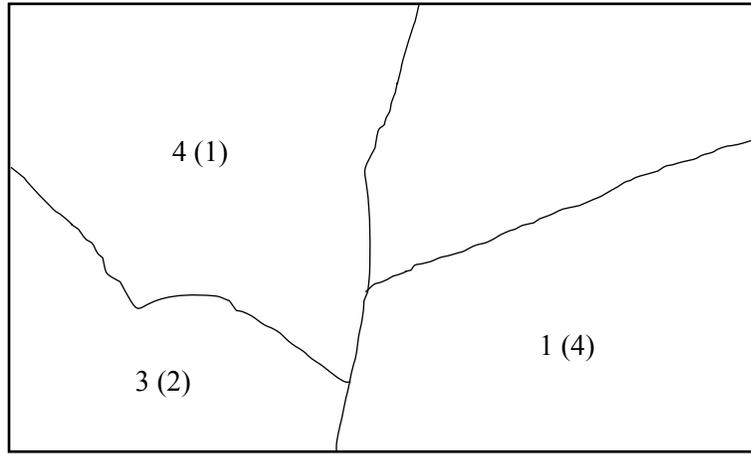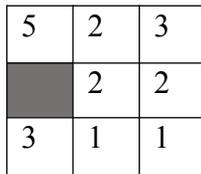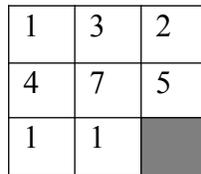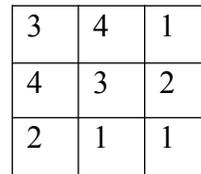| Q 9	Calculate Geary's index (c) and Moran's index (I) to measure the Spatial Autocorrelation for the zones and the attribute values of the corresponding zones shown in the following figure: Figure 1	20	CO4 CO5

Q 10
(A)
	i. Following three figures (Figure 2, 3, 4) represent three input raster.
	
	Figure 2 Figure 3 Figure 4
	
	Show the output raster if the local operation uses minimum statistic.
	
	ii. Consider the given R code for Raster data manipulation:
	
	`library(raster)`
	`## Loading required package: sp`
	`# RasterLayer with the default parameters`
	`x <- raster()`
	`x`
	`## class      : RasterLayer`
	`## dimensions  : 180, 360, 64800`
	`## resolution  : 1, 1  (x, y)`
	`## extent      : -180, 180, -90, 90`
	`## coord. ref. : +proj=longlat +datum=WGS84 +ellps=WGS84 +towgs84=0,0,0`
	
	Now, answer the followings:
	a. What is represented by the three values mentioned in the parameter "dimensions".
	b. Write down the implication of the values specified in the parameter "extent".
	c. How the resolution of the above-mentioned raster can be modified.
		20	CO1
			CO5
			CO7

	d. How the number of cells is related to the number of rows and the number of columns of this raster?		
	OR		
Q 10 (B)	i. Figure 5 represents an input raster. 	1	2	2	2	2
1	2	2	2	3
1	2	1	3	3
2	2	2	3	3
2	2	2	2	3 | Figure 5 Show the output raster for the shaded region if the neighborhood operation uses the minority statistic. ii. Neighborhood operations are also called focal operations. What is a focal cell? iii. What is a 'shapefile'? Which package is required to be installed to use 'shapefile'? iv. What is RasterStack and RasterBrick?	20	CO1 CO5 CO7

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