



First Semester 2022-2023

CE F431 Principles of Geographical Information Systems

Mid-semester Examination

Weightage: 25%

Maximum Marks: 25

Date: 5.11.2022

Duration: 1.5 Hours

Nature of Exam: Closed Book

Answer All Questions

Section-1

1. Complete the grid.

[8*0.5=4M]

Along

- A. The only parallel which is a great circle [7]
- B. The satellite of the European Space Agency [8]
- C. The technique for determining the DN values after geometric transformation of an image [10]
- D. The spatial resolution [4]

Down

- E. The lines of equal longitude values [8]
- F. The spatial interpolation technique [3]
- G. The sensor resolution related to revisit period [8]
- H. Spectral index for discriminating land and water [4]

A				G					
	E		B						
C							H		
		D, F							

2. Differentiate between the following.

[1*4=4 M]

- a) User's accuracy vs Producer's accuracy
- b) UTM vs Stereographic projection
- c) Secant vs tangent projection
- d) Optical vs SAR satellite images

3. Answer the following.

[3M]

- a) Define the scale factor of a map projection.
- b) What is the value of the scale factor assigned for the central meridian of a UTM zone? Based on what criteria the corresponding value has been assigned?
- c) How will you check mathematically whether a given map projection is conformal or not?

4. What do you mean by topology in GIS? Explain with examples. [2M]
5. What do you mean by the statement 'Voronoi diagram is the dual of Thiessen polygon'? [1M]
6. Write any two specific applications of GIS in the field of Civil Engineering. [1M]

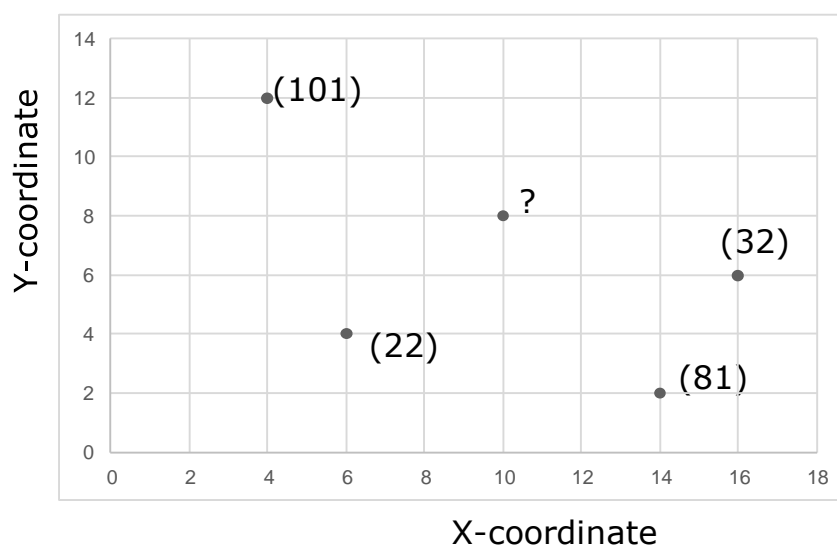
Section-2

1. Calculate the shortest distance between BPHC and BITS-Pilani campus using the great circle distance formula. [3M]

Location	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
BPHC	17.5449	78.5718
BITS-Pilani	28.3604	75.5876

Consider the radius of Earth = 6370 Km.

2. Apply the mid-point line algorithm for rasterizing a line that starts from (5,8) and ends at (9,11).
The value in the bracket shows the x and y coordinates respectively. Consider pixels of unit size.
Write each step of rasterization. [3M]
3. A) Differentiate between exact and in-exact spatial interpolation techniques. [1M]
B) The following figure shows the locations of rain gauges and the values in bracket shows the rainfall recorded in mm. Apply IDW interpolation technique to determine the rainfall of the unknown location. [3M]



-----All the Best-----