CE-432 Geographical Information System

LABORATORY - 1
(2022-23: 2nd SEMESTER)

Objective

The objectives of this exercise are to understand and interpret a map with information regarding different spatial features and also to carry out some basic spatial data operations.

Material

For this exercise, you are provided with four thematic layers of this area (Building layer, IIT Kanpur Layout, Road network and academic area boundary layer) and have to mark (draw the patch) at all the possible locations (maximum 3) over the map with priority numbering (1 being the highest). All 'white' area is open space and considers that there are no trees or bushes in the open space. Also, all roads shown are open to the sky and of same width, i.e., 3 m.

Problem 1

A student in IIT Kanpur wants to set up his experimental system at a location with the following requirements:

1. He needs a patch of at least 30 m X 30 m area in the open space.
2. The land parcel should be minimum 15 m away from the centerlines of the roads in the campus (all types of road). Farther the patch from roads better is the patch.
3. The land parcel should be within the academic area.
4. The land parcel should be away from buildings by a minimum distance of 10 m. Larger the separation better is the patch.
5. The preferred area of the parcel should be as near as possible from the boundary wall of the academic area as the experiment will need to drain an effluent out of the boundary through an underground pipe.

Problem 2

A sensitive instrument has to be moved from place A to place B (these places are marked on the map) via road such that:

1. Travel path is least.
2. Travel path must pass through any of the roads (partly or in full) around 'Hall 1' boundary before reaching point B.

Information

You will not be using any computer or software for answering these queries. However, you are free to use any other method/tool/instrument etc. for this purpose. You are not being advised on how to solve these problems as it is entirely your choice.

Submission

1. A detailed report explaining the steps employed and logic behind the explanation.
2. Show your answers over the map given to you.

Questions

1. Had you been permitted to use the computer how you would have done this problem? Write a few points on this step by step
2. Is there any possibility of shortest route from A to B if the condition of passing through Hall 1 road as discussed in Problem 2 is removed?

SUBMISSION DUE DATE: 07:00 PM, 10th January (Tuesday)