1. Explain the meaning and definitions of map?

The word "map" comes from the latin word "Mappa", it means napkin or cloth. The Greeks and the Romans prepared their maps on cloth, even though we can see in India, village revenue and land officials prepared on long cloth.

A map is a graphic representation of the features on the earth surface. Therefore it is a storehouse of spatial information, commonly used to evaluate the topologic and metric properties of the geographic features on a map, ex. Distance, direction, connectivity and proximity. These attributes enable us to identify the spatial patterns of association of the geographical features. Thus, a map conveys two fundamentals properties viz., Locations and attributes. Locations are positions in two-dimensional space as places with the coordinates X and Y, which shows the latitude and longitude of the location. Attributes are qualities of that location for example temperature condition of that location, direction, whether condition etc.

Definitions of maps

Britanica Encyclopedia

Map as "A systematic representation on a surface of the nature and distribution of phenomena in space."

The American Society of Civil Engineers has defined in 1954,

A map as "a representation on a plane surface, at an established scale of the physical features of a part or the whole of the earth's surface, by the use of signs and symbols and with the method of orientation indicated and also a similar representation of the heavenly bodies."

2. How to calculate the Road density?

Route density is usually expressed in kilometer route way per hundred kilometer of territory or per 1,00,000 population.

Formula is

Road length X 100

Road length X 100

total population

Total area

3. Explain the topological measures of connectivity

The topological measures are

- 1. Cyclometic number
- 2. Alpha index
- 3. Beta index
- 4. Gama index
- 5. Eta index
- 6. Eta index
- 7. Theta index

1. Cyclometic number (µ)

It is simple index and indicates the number of circuits in a network. It is given by

 $\mu = E-V+G$

where E is the number of edges and V is the number of vertex of the given network and G is the number of graph.

It should be noted that Cyclometic number increases with the completeness of the connection and the complexity of the network. In that case there will be more number of edges lesser number of vertices. Cyclometic number would bear a direct relationship with the levels of development of a region.

2. Alpha index (^오)

It is the ratio of actual number of circuits and the maximum number of possible circuits.

$$\mathcal{R} = \underline{\text{E-V+G}}$$
2V-5G

The value of \mathcal{R} varies from 0 to 1. The value of $\mathcal{R} = 1$, shows that the network is completely interconnected as the number of edges decrease the connectivity value also decrease.

3. Beta index (β)

The index beta is the ratio edges to vertex.

 $\beta = E/V$

B is the simplest measure at the same time it is a very useful index also. Disconnected graphs and those in the form of trees with several branches but no circuits will have β values less than 1.0. The value of $\beta = 1$ will correspond to a network with only one circuit. A values of $\beta > 1$, it will correspond to more complex network with an increase number of edges in relation to vertices.

4. Gama index (γ)

The gama index is the ratio of actual number of edges or route connections to the maximum possible number of route connections or edges.

 $\gamma = E / 3(V-2G)$

The value of the value of Gama index (γ) also varies between 0 and 1. When $\gamma=0$ it means E=0 i.e there is no edge or connection in the network. The value of $\gamma = 1$ shows the maximum number of connections between vertices in the network.

5. Eta index ($^{\gamma \gamma}$)

The index of Eta represent the average length of the edges and is thus given as the ratio of the total length of all edges.

 $\gamma = M / E$

higher value of Eta index indicate lower development of transport network and vice versa.

6. Theta index (9)

It represents the average length of edges per vertex

 $\theta = M / V$

The index shows the length, structure and also the degree of connectivity.

4. Give note on influencing factors of industrial location

The important influencing factors are

- 1. availability of raw materials,
- 2. power resources,
- 3. cheap and efficient labor,
- 4. land at cheap rate for industrial establishment,
- 5. market for produced goods,
- 6. Transport facilities as well as incentives of government.

5. What is cropping pattern

The cropping pattern is meant the portion of area under different crops at a point of time. A change in cropping pattern implies a change in the portion of area under different crops.