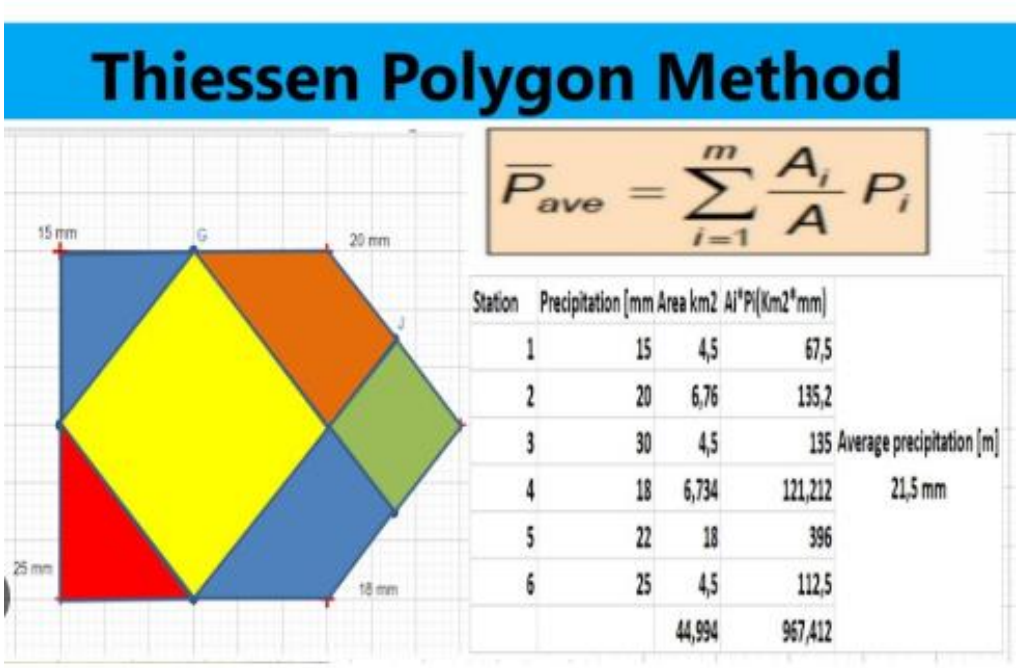
1.1SPATIAL ANALYSIS OF RAINFALL DATA USING THIESSEN POLYGON AND ISO-HYETAL METHODS

Theissen polygon method is used to determine the average rainfall on a catchment area. In this method, we draw triangles by joining all the rain gauges and then polygons are formed by their perpendicular bisectors. Now each rain gauge represents the rainfall of the polygon area which encloses that rainguage



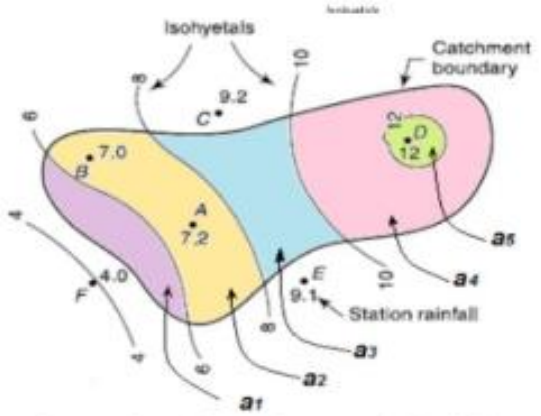
Station	Precipitation [mm	Area km2	Ai*Pi(Km2*mm)	
1	15	4,5	67,5	
2	20	6,76	135,2	
3	30	4,5	135	Average precipitation [m]
4	18	6,734	121,212	21,5 mm
5	22	18	396	
6	25	4,5	112,5	
		44,994	967,412	

IsohyetalMethod:Isohyets are contours of equal precipitation analogous to contour lines on a topographic map. In this method, precipitation values are plotted at their respective stations on a suitable base map and Isohyets are drawn to create an Isohyetal map.

The steps for creating the isohyetal map and determining the areas Aj are:

1. Plot stations on a map (drawn to scale)
2. Draw contours of equal precipitation (isohyets)
3. Measure area in basin between each contour.
4. Multiply area (Aj) by the average of the contour (isohyet) values (Pj)
5. Sum and divide by total area (A)

Isohyetal range [mm]	Average Isohyetal range [mm]	Area [km2]	P*A [mm*Km2]
0-10	5	5	25
10-20	15	18	270
20-30	25	12	300
30-40	35	12	420
		47	1015



$$\bar{P} = \frac{a_1\left(\frac{4+6}{2}\right) + a_2\left(\frac{6+8}{2}\right) + \ldots + a_4\left(\frac{10+12}{2}\right) + a_5(12)}{a_1 + a_2 + \ldots + a_4 + a_5}$$