Section-2

Q1 Explain the concept of S-hydrograph and under what circumstance you would adoption of this hydrograph. Give a clear associated Sketch.

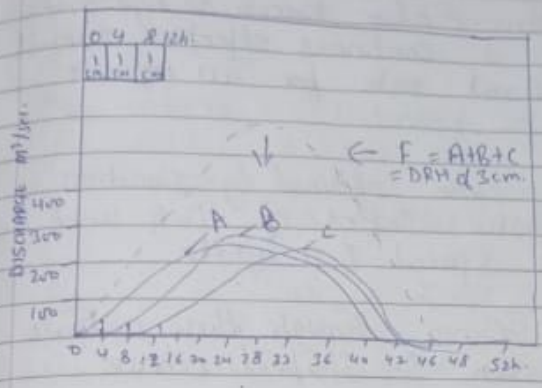
Ans. Concepts:-

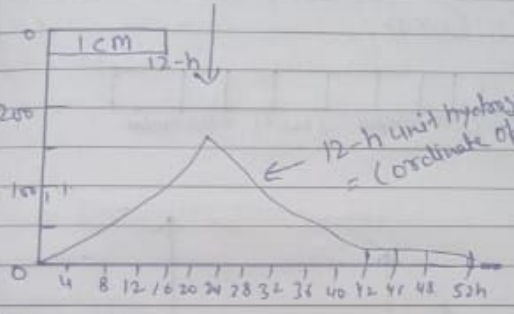
① Ideally, unit hydrograph are derived from simple isolated storms and if the duration of the various storms do not differ very much, say with in a band of ± 20% D, they would all be grouped under one average duration of D-h.

② If in practical application unit hydrograph of different duration are needed they are best derieved from field data

③ Lack of adequate data, normally precludes development of unit hydrograph covering a wide range of duration of given catchment.

④ Under such situation D-hour unit hydrograph is used to develop unit hydrograph of different duration nD





This S- curve

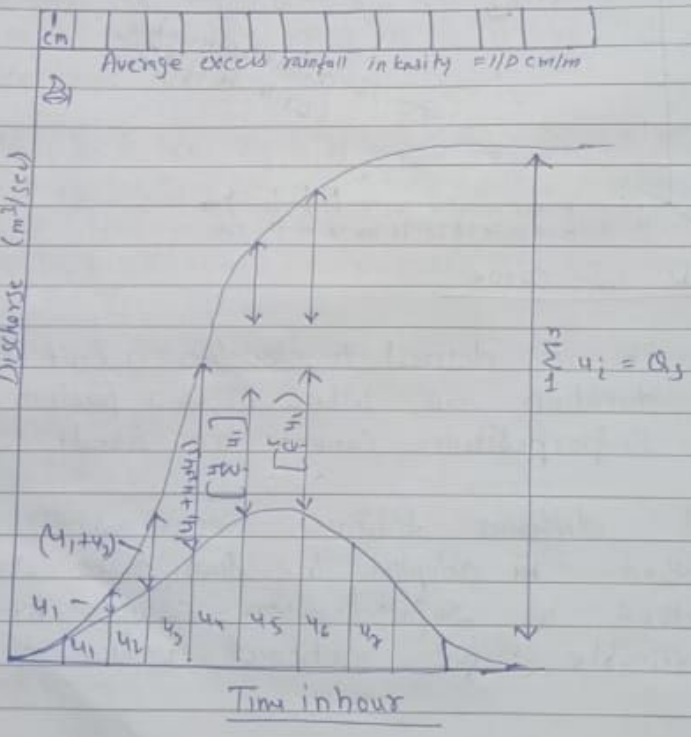
(i) If it is desired to develop a unit hydrograph of duration mD, where m is a fraction, the method of superposition cannot be used.

(ii) A different technique known as the S curve method is adopted in such cases, and this method of superposition cannot be is applicable for rational values of m.

③ The S- curve also known as hydrograph produce by a continous effective rainfall at a constant rate for an infinite Period.

④ It is a curve obtained by sumation of an infinited series of D-h unit hydrograph spaced D-h apart.

⑤ A smooth curve through these ordinate result in an S- shaped curve called - S- Curve.



6) This S- curve is due to a D-h unit hydrograph.

The average intensity of ER producing the S curve is 1/D cm/h and the equilibrium discharge

$$Q_s = \left[\frac{A}{D} \times 10^4\right] m^3/h$$

$$Q_s = 2.778 \frac{A}{D} \; m^3/sec$$

Where A is the Km^2 and D is in h.