HindPhotostat

GET IT ON Google Play

MADE EASY , IES MASTER , ACE ACADEMY , KREATRYX

ESE , GATE, PSU BEST QUALITY TOPPER HAND WRITTEN NOTES
MINIMUM PRICE AVAILABLE @ OUR WEBSITE

1. ELECTRONICS ENGINEERING
2. ELECTRICAL ENGINEERING
3. MECHANICAL ENGINEERING
4. CIVIL ENGINEERING
5. INSTRUMENTION ENGINEERING
6. COMPUTER SCIENCE

IES ,GATE , PSU TEST SERIES AVAILABLE @ OUR WEBSITE

- IES –PRELIMS & MAINS
- GATE

➢ NOTE;- ALL ENGINEERING BRANCHS

➢ ALL PSUs PREVIOUS YEAR QUESTION PAPER @ OUR WEBSITE

PUBLICATIONS BOOKS -

MADE EASY , IES MASTER ,ACE ACADEMY ,KREATRYX ,GATE ACADEMY, ARIHANT ,GK

RAKESH YADAV, KD CAMPUS , FOUNDATION , MC –GRAW HILL (TMH) ,PEARSON...OTHERS

HEAVY DISCOUNTS BOOKS AVAILABLE @ OUR WEBSITE

F230, Lado Sarai New Delhi-110030 Phone: 9311 989 030	Shop No: 46 100 Futa M.G. Rd Near Made Easy Ghitorni, New Delhi-30 Phone:9711475393	F518 Near Kali Maa Mandir Lado Sarai New Delhi-110030 Phone: 9560 163 471	Shop No.7/8 Saidulajab Market Neb Sarai More, Saket, New Delhi-30

Website: www.hindPhotostat.com

Contact Us: 9311 989 030

Courier Facility All Over India

(DTDC & INDIA POST)

Hydrology

Abhishek Kumar

Content

1. Introduction

Hydrology → Hydro + logy
- Hydro → water
- logy → study.

- Hydrology is an earth science involving the study of water of earth.

Hydrological cycle

- It is a global sun driving process in which water is transported from ocean to the atmosphere then to the land and then back to sea.
- It is a continuous process with no definite starting point.
- A convenient starting point to describe this cycle is taken as ocean.
- Extent: 1 km below the earth surface to 15 km above the earth surface.

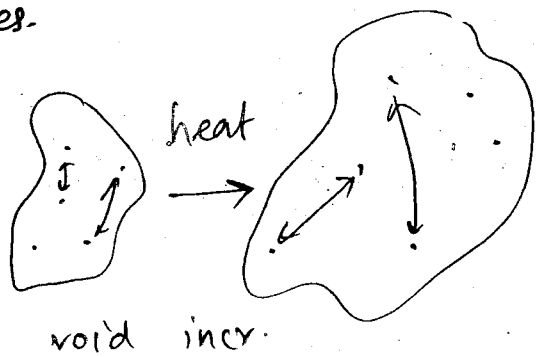
Note:
Relative Humidity (RH) → for constant temp.

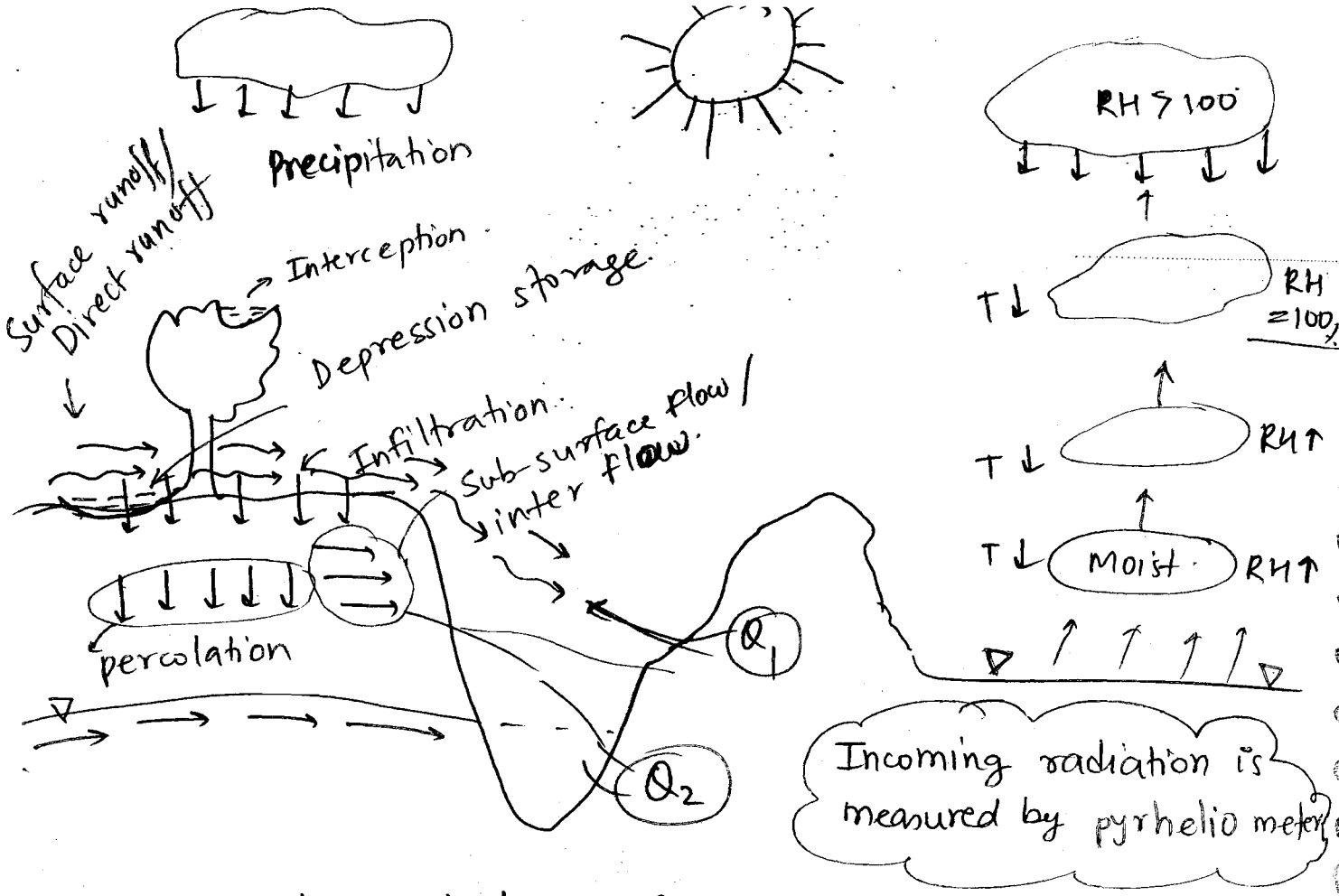
$$RH = \frac{\text{Actual vapour carried by air}}{\text{Maximum vapour carrying capacity}} \times 100$$

- As temp decreases RH increases.

Humidity is measured by Hygrometer

$$RH \propto \frac{1}{\text{temp.}}$$





- Due to solar radiation, falling on ocean surface water evaporates and mixes with dry air above making it moist.
- Moist air being lighter than dry air rises and in the process cool down thereby increasing its relative humadity....
- Relative humadity subsiquently reaches 100 %. (full saturation)
- Any further rise in elevation of moist air causes condensation followed by precipitation.

Note :

- for Condensation to take place. presence of condensation nuclei is essential

(Dust / salt particles serve as condensation nuclei)

Important definition :

Evaporation (E) : change of water from liquid to Gaseous phase.

Precipitation (P) : Deposition of water on earth surface as rain, snow, hail, sleet etc.

Infiltration (I) : Movement of water into the soil at earth surface.

Percolation (P_1) : Movement of water from one soi zone to lower soil zone.

Interception (I_1) : Short term retention of water by vegetation, roof tops, pavement etc.

Transpiration (T) : It is the process in which water absorbed from ground and evaporated it into the atmosphere through its leave.

Inter Flow (I_2) : It is also known as sub-surface flow. It is the ground water flow horizontly above the water table.

Depression storage (D_s) : Rain water accumulated in small depression or ditches above the surface.

Surface Runoff (R) : The part of rain which reaches the stream immidiately after the rainfall flowing over the surface.

- It is also sometimes called direct runoff, effective rainfall or rainfall excess.

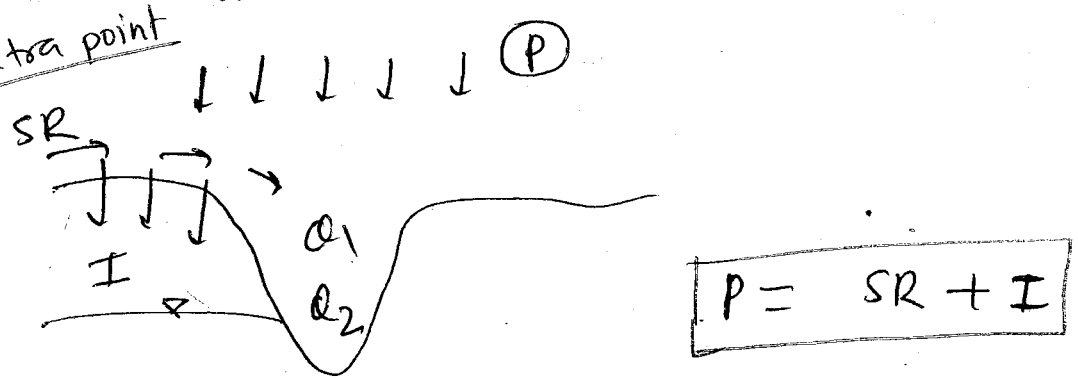
Note:
Actually direct runoff is slightly more than surface runoff but for all practical purposes they are taken as same.

Q_1 : It is the discharge obtained in stream due to surface runoff / direct runoff.

Q_2 : It is the discharge obtained in the stream due to ground water table (through seepage), it is also known as base flow, dry weather flow or effluent flow.

- Evaporation from ocean contributes to 90% of atmospheric moisture
- In ocean about 8% more water vapour evaporates then falls back as precipitation.

Extra point

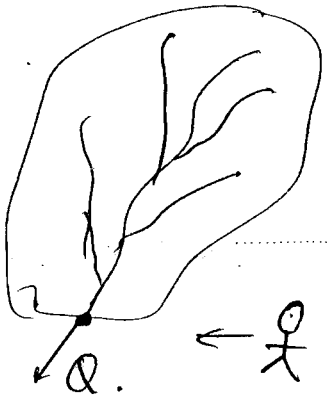


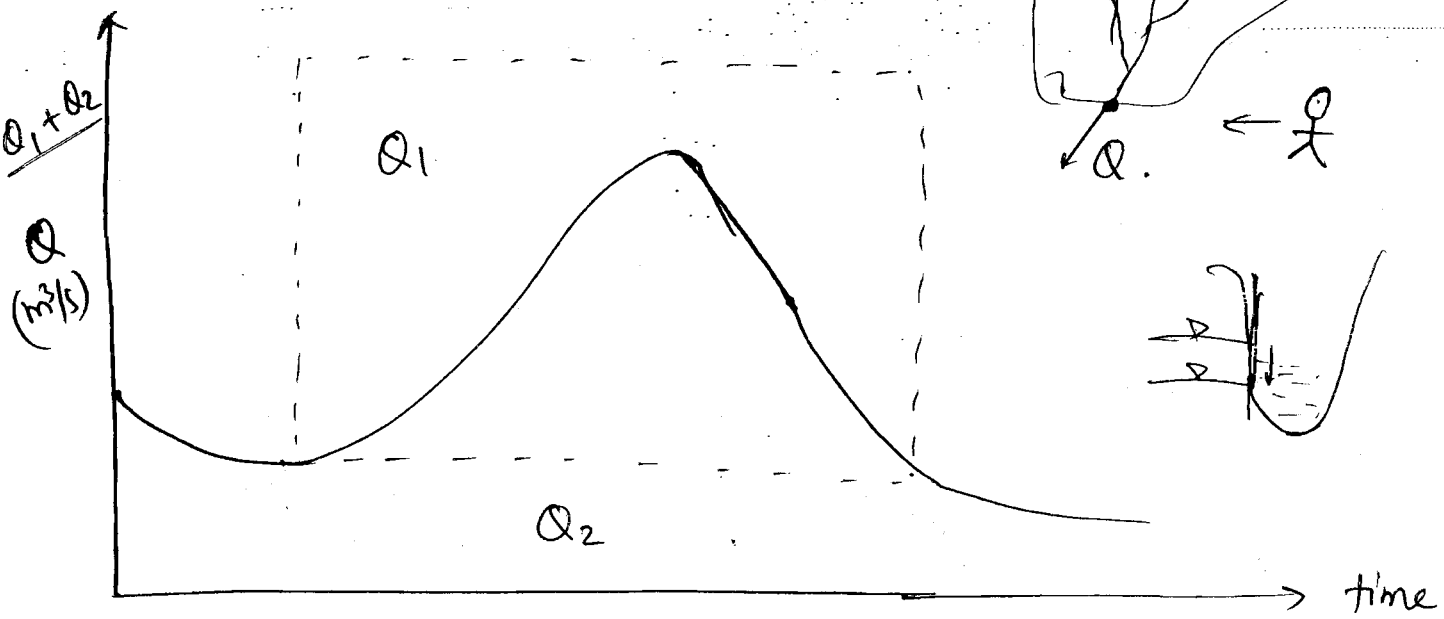
$$P = SR + I$$

wind velocity is measured by anemometers

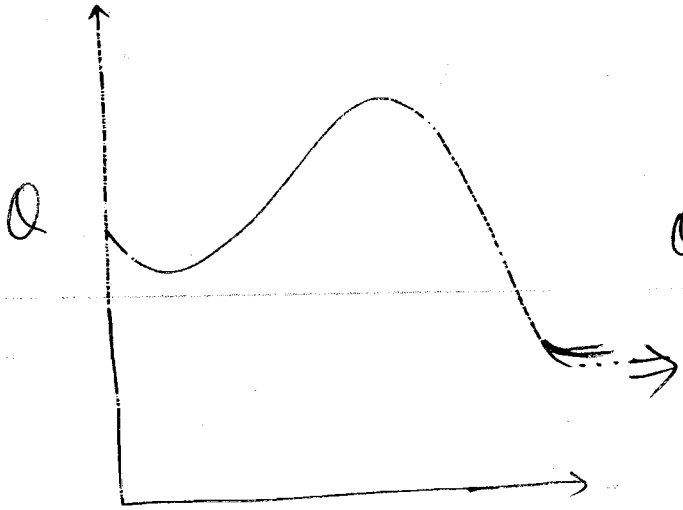
Hydrograph

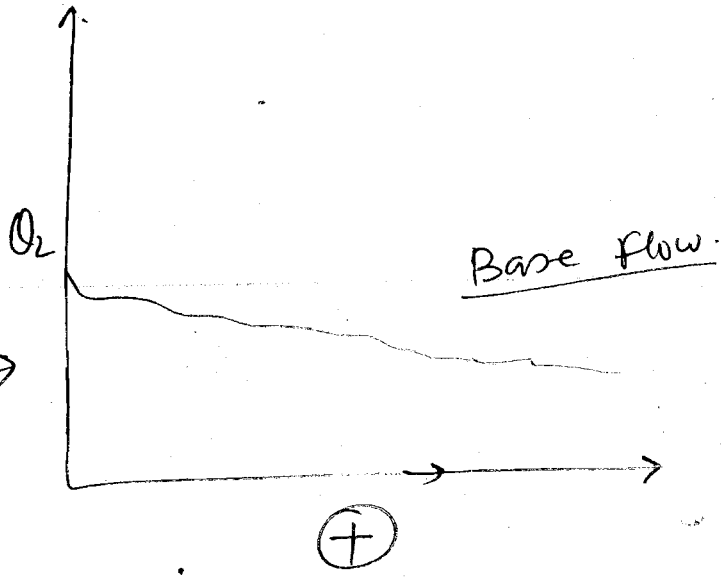
- plot of discharge against time.

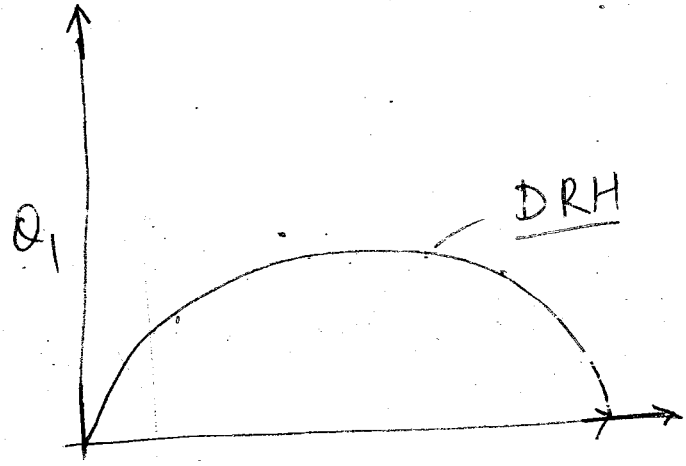




Hydrograph / Flood Hydrograph

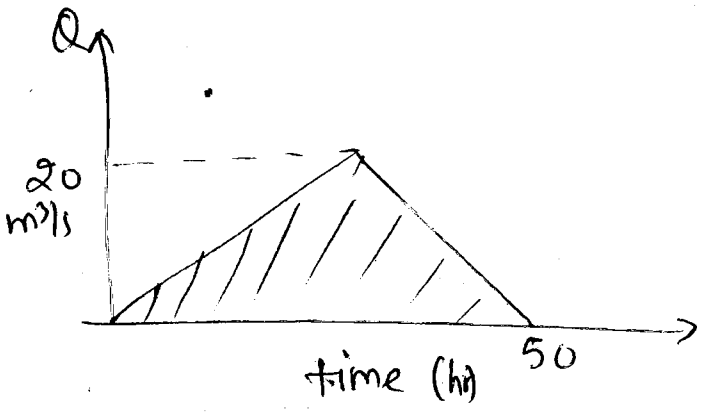






Area of DRH = Volume of SR / DR / Effective Rain fall. excess

Q Find the volume of effective rain for the DRH Given below.



Soln:

volume of effective rainfall

$$= \text{Area of DRH}$$

$$= \frac{1}{2} \times 50\,hr \times 20\ m^3/s$$

$$= \frac{1}{2} \times 50 \times 3600 \times 20$$

$$= 1.8 \times 10^6\ m^3.$$

Catchment Area / Water sheds : (open)

- Catchment area is an area of land where surface water from rain and melting snow converges to a single point usually the exit of the catchment where the water joins another water bodies like river, lake, ocean etc.
- It is also known as watershed, river basin or basin.