Water Resources Engineering

Question & Answer

Part-A

UNIT-I

1. Write short notes on Global water resources survey?

The world total water resources potential are estimated to be 1.37X108 million ha-m. Of these global water resources about 97.2% is salt water, mainly in oceans and only 2.8% is available as fresh water at any time on planet earth.

2. Mention about the ground water potential of the planet earth?

Saline Water = 97.2%

Fresh Water = 2.8%

Out of these 2.8% about 2.2% is available as surface water and 0.6% as ground water. Even out of this 2.2% of surface water, 2.15% fresh water available in glaciers and icecaps and only of the order of 0.001% is available in lakes and reservoirs, 0.0001% in streams; the remaining in other forms 0.001% as water vapor in atmosphere. Out of 0.6% of stored ground water, only about 0.3% can be economically extracted with the present drilling technology, the remaining being unavailable as it is situated below a depth of 800 m.

3. Write short notes on India's water resources potential?

India's with a geographical area of nearly 3.3 million square kilometers experiences extremes of climate. Normal annual rainfall varies from 100 mm in Western Rajasthan to over 1100 mm at Cherabunji at Megalaya. Variability of rainfall from season to season is also very high. The average annual rainfall over the country is of the order of 1170 mm.

The average flow in the river systems of the country has been estimated to be 1880 km^3, but over 90% of the annual runoff in peninsular rivers and over 80% of the annual runoff in Himalayan rivers occur during the four monsoon months of June to September.

4. Enlist few major river basins of India.

i) Indus	ii) Ganga	iii) Brahmaputra
iv) Brahmani	v) Mahanadhi	vi) Godavari
vii) Krishna	viii) Pennar	ix) Cauvery
x) Tapti	xi) Narmadha	xii) Mahi
xiii) Sabarmati	xiv) Subernareke	

5. What are the steps involved in water resources planning?

i) Statement of purpose	ii) Evaluation of alternatives
iii) Systematic consideration of project	iv) Selection of project.

6. What are all the investigations in project planning?

i) Explanatory Studies	ii) Feasibility studies
iii) Final studies	

7. What are all the essential data's necessary for water resources planning?

i) Hydrological and climate data to ascertain rainfall, surface and ground water availabilities.

ii) Geological data to determine the type of foundation available for locating dam site.

iii) Topographical data to collect information of land use, land slopes, valleys, ridges, etc.

8. What are all the steps involved in project formulation?

i) Defining boundary conditions

ii) Defining project alternatives

iii) Timing of alternatives

9. What are all the drawbacks in project planning?

i) Unsound preliminary report

ii) Inappropriate design criteria

iii) Time lag in the construction and use of the project

iv) Neglecting economic analysis of the project

v) Failure to consider all alternatives

vi) Non-Consideration of the next best alternative

UNIT II

1. How the precipitation can be measured?

It can be measured by the rain gauge. The rain gauge may be

i) Recording type rain gauge

ii) Non-Recording type rain gauge.

2. What are the demerits of Non-recording type rain gauge?

It does not give information regarding

- Beginning of the rainfall
- End of the rain
- Intensity of rainfall

3. Enlist the three types of recording type rain gauge?

i) Tipping bucket

ii) Weighing bucket

iii) Floating bucket

4. Write short notes on rain gauge density?

It is the number of rain gauge is to erected in an given area.

Rain gauge density = No of rain gauges / Area

5. What is the use of Double mass curve?

It is used to check the consistency of the rainfall record. In double mass curve a graph is draw between the cumulative values of average rainfall of base stations as the abscissa against the corresponding cumulative value of rainfall of the stations under let as ordinate.

6. What is the use of frequency analysis?

It is used to find the probability of occurrence of extreme rainfall. The probability of occurrence of rainfall whose magnitude is equal to or greater than specified magnitude is given by

T = N+1/m

Where, T=return period

m=rank

n=no of years of rainfall record

7. Enumerate the methods used to estimate the amount of evaporation from a water surface?

i) Evaporimeters

ii) Analytical methods

iii) Empirical formulae

8. Write short notes on Evaporimeters?

i) Class A evaporation pan

ii) ISI Standard pan

iii) Colarodo sunken pan

iv) US geological survey floating pan.

9. Define pan co efficient?

Pan co efficient = lake evaporation/pan evaporation

10. Enlist the instruments used to measure transpiration.

i) Lysimeter

ii) Field plots

11. Define infiltrometers and mention its type?

Infiltrometers are the devices used to measure infiltration. There are two kinds of infiltero meter.

i) Flooding type infiltrometer

ii) Rainfall simulator

UNIT-III

1.Define Irrigation.

1.The process of artificially supplying water to soil for raising.

2.It is science of planning and designing an efficient, low cost, economic irrigation system to fit natural condition.

Irrigation engineering includes to study and design of work in connection with river control, drainage of water logged areas, and generation of hydroelectric power.

2.Define duty of irrigation.

Represents the irrigation capacity of a unit of water

Duty=Area of irrigation/discharge

Unit =hectares/cumcc.

3.Define delta of a water.

It is total depth of water required by a crop during the entire pride the crop is in the field and is denoted by the symbol

4.Define crop period.

It is the time in days that a crop takes from the instant of its lowing to that of iys harvesting.

5.Define base period.

For a crop refers to the whole period of cultivation from the time when irrigation water it fittest issued for preparation of the ground for planting the crop to its last watering before harvesting.

6. State relationship between duty and delta.

=8.64B/D

Where;

D=duty in hectare/cumee

B=base period in day

7. What is mean by consumptive use of water.

Evapo transpiration (or) consumptive use of water by a crop is the depth of water consumed by evaporation and transpiration during crop growth including water consumed by accompanying weed growth.

8.What is meant by evaporation.

Evaporation is the transfer of the water from the liquid to vapour state. The rate of evaporation from water surface is proportional to difference between the vapour pressure at the surface and the vapour pressure over laying air.

9.What is mean by transpiration.

It is the process by which plants dissipate water from the surface of their leaves, stalks and trunks in the process of growth.

10.What are the factor affecting consumptive uses of water.

1.Evaporation
2.Mean monthly fern
3.Season
4.Crop pattern
5.Monthly precipitation
6.Depth of water
7.Wind velocity
8.Soil and topography
9.Monthly irrigation

11.What are the methods available for direct measurement of consumptive use.

1.Tank and lysimeter
2.Fierd experimental plots
3.Soil moisture studies
4.Integration method
5.Inflow method

12.Expand the term C.I.R

The term C.I.R refer to consumptive irrigation required is defined as the amount of irrigation water that is required to meet the evapo-transpiration of the crop during the full growth.

Therefore;

C.I.R= Cu-Re

Where;

Cu=consumptive use of water.