Sub Code:ECE702

Paper Id: 100731 Roll No:

B. TECH
(SEM -VII) THEORY EXAMINATION 2019-20
WATER RESOURCES ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. Define Unit hydrograph.
b. Explain various types of precipitation.
c. Write down the relation between Duty and Delta.
d. Define PET and AET.
e. Define intensity of irrigation.
f. Explain Lacey's silt factor.
g. What do you meant by consumptive use of water?
h. Write a short note on synthetic unit hydrograph.
i. Define silting and scouring in canals.
j. Explain well losses and well shrouding.

SECTION B

2. Attempt any *three* of the following: 10x3=30

a. A catchment has six raingauge stations. In a year, the annual rainfall recorded by the gauges are as follows:

Station	A	B	C	D	E	F
Rainfall(cm)	82.6	102.9	180.3	110.3	98.8	136.7

Calculate the optimum number of rainguages stations in the catchment for 10% error.

b. Write a short note on 'synthetic Unit Hydrograph,. How will you derive the synthetic unit hydrograph from a number of unit hydrograph? Illustrate the method with suitable example in a tabular form.

c. Differentiate between Kennedy's and Lacey's theory for design of alluvium channels. Explain defects in Kennedy's theory.

d. Define Well Efficiency. What are the various factors governing the selection of suitable site of a tube-well?

e. What is the problem of water logging? What are the poor effects of water logging? Describe some suitable remedial measures against water logging in brief.

SECTION C

3. Attempt any *one* part of the following: 10x1=10

a. Write down the water budget equation for a catchment. Define which type of precipitation generally occurs in India.

b. Define following terms:
   i. Depth area duration curve
   ii. Probable Maximum Precipitation
   iii. Evapotranspiration
   iv. Φ-index

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4. Attempt any *one* part of the following: 10x1=10

a. Define surface runoff. Explain the factors affecting the runoff.

b. What do you understand by consumptive use of water? What are the factors affecting consumptive use of water? List the various direct methods of a measurement of consumptive use of water.

5. Attempt any *one* part of the following: 10x1=10

a. Design an irrigation channel to carry a discharge of 30 cumec by Kennedy'stheory. Take B/D ratio as 8.0, N= 0.0225 and m = 1.0.

b. Using Lacey's theory, design a trapezoidal irrigation channel (side slope, 1H: 2V) carrying discharge of 40 m^3/sec. Take silt factor as 1.0.

6. Attempt any *one* part of the following: 10x1=10

a. What is cross drainage works? What are the various types of cross drainage works?

b. What is the concept of river training? What do you mean by river training for discharge and river training for depth and river training for sediment? List the various types of river training works and explain anyone of them with suitable sketches.

7. Attempt any *one* part of the following: 10x1=10

a. Describe Confined and Unconfined aquifer with suitable diagram. Derive the expression for the discharge through confined aquifer.

b. Define following terms:

i. Aquifer
ii. Aquiclude
iii. Aquitard
iv. Aquifuge
v. Porosity