Sub Code: NCE035

Paper Id: 100707 Roll No:

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

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.	Describe losses in well.
b.	What is flood routing?
c.	Define depression storage.
d.	Why is base flow separated from total runoff?
e.	What is return period?
f.	What is probable maximum precipitation?
g.	Define Unit Hydrograph.
h.	Describe rainwater harvesting.
i.	What do you mean by specific capacity?
j.	Give full form of PWP and define it.

SECTION B

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

a.	What is meant by Probable Maximum Precipitation (PIIP) over a basin? Also explain, how PMP is estimated?
b.	Discuss briefly the various abstractions that takeplace from the precipitation.
c.	Derive the expression for discharge from the well in a confined aquifer.
d.	A catchment has five rain-gauge stations. In a year, the annual rainfall recorded by the gauges is 89 cm, 90 cm, 90.5 cm, 103 cm and 91 cm. For a 5% errorin the estimation of the mean rainfall, determine the additional number of gaugesneeded.
e.	List various direct methods of measurement of consumptive use of water.

SECTION C

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

a.	The following table gives values of measured discharges at a stream gauging site in a year. Upstream of the gauging site a weir built across the stream diverts 3.0 Mm^3 and 0.50Mm^3 of water per month for irrigation and for use in an industry respectively The return flows from the irrigation is estimated as 0.8 Mm^3 and ,from the industry at 0.30 Mm^3 reaching the stream upstream of the gauging site. Estimate the natural flow, if the catchment area is 180 km^2 and the average annual rainfall is 185 cm, determine the runoff-rainfall ratio.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Gauge Flow(Mm^3)	2	1.5	0.8	0.6	2.1	8.0	18.0	22.0	14.0	9.0	7.0	3.0

b.	During a flood flow the depth of water in a 10m wide rectangular channel was found to be 3.0m and 2.9m at two sections 100m apart. The drop in the water surface elevation was found to be 0.12m. Assuming manning's coefficient to be 0.025, estimate the flood discharge through the channel.

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

a.	Define evaporation. Discuss the factor that affects the evaporation from a water body.
b.	Distinguish between i. Infiltration capacity and infiltration rate. ii. Actual and Potential evapotranspiration

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

a.	What is Hydrograph? Draw a single peaked hydrograph and explain its components.
b.	Describe various types of tubewells.

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

a.	The isohyets for annual rainfall over a catchmentbasin were drawn. The areas of strips between isohyets are indicated below. Find the averagedepth of annual precipitation over the basin.

Isohyet (cm)	Area (km^2)	Isohyet (cm)	Area (km^2)
50-60	600	80-90	1010
60-70	2541	90-100	600
70-80	8745	100-110	250

b.	Write short notes on: i. Flow measuring structures. ii. Mass curve of rainfall iii. Depth area duration curves

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

a.	Sketch atypical flow duration curve. Also explain how it can be used in water resources planning and development activities?
b.	Explain the rational method of computing the peak discharge of a small catchment. Where it is commonly used and what are its merits and demerits? Also discuss the runoff coefficient C of the rational formula.