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Paper ID 100707 Roll No.

B. TECH.
(SEM VII) THEORY EXAMINATION 2018-19
ENGINEERING HYDROLOGY

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

a. Discuss Depression storage.
b. What are methods to assess the recharge of ground water in an area?
c. Discuss flood frequency analysis
d. Write short note on Global Water Budget.
e. Define synthetic unit hydrograph.
f. What is a "Return Period"?
g. Define Probable Maximum Precipitation.
h. What is transmissibility?
i. Why is base flow separated from total runoff?
j. Define Recurrence interval of flood

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. State the Horton's equation for infiltration capacity curve and sketch with the salient components of the curve. And explain briefly about the ϕ-index and w-index.
b. The following are the ordinates for a flood hydrograph resulting from an isolated storm of 6 hours duration.

Time (hr)	0	12	24	36	48	60	72	84	96
Ordinates of flood Hydrograph	5	15	40	80	60	50	25	15	5

Determine the ordinates of 1 cm- 6 hour unit hydrograph if the catchment area is 450 Km^2.
c. List the various direct methods of measurement of consumptive use of water.
d. How will you derive the synthetic unit hydrograph from a number of unit hydrograph? Illustrate the method with suitable example in a tabular form.
e. Derive an expression for discharge from a well in unconfined aquifer. The well fully penetrates it.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain the concept of S-hydrograph and under what circumstances you would adoption of this hydrograph. Give a clear associated sketch.
(b) What do you mean by probable maximum precipitation (PMP) over the basin? Explain how PMP is estimated.

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4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Define Unit Hydrograph. Explain its assumption and uses. A 12-hr. UH of a catchment is triangular in the shape with a base width of 144 hr and peak discharge of 23 m^3/s. Calculate the area of the catchment.

(b) Briefly distinguish between :
- (i) Actual and Potential evapotranspiration
- (ii) Field Capacity and permanent wilting point
- (iii) Depression storage and interception
- (iv) Infiltration capacity and infiltration rate.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) The ordinates of a 4 hr unit hydrograph of a basin of area 300 km^2 measured at 1 hr intervals are 6, 36, 66.91, 106, 93.79, 68, 58.49, 41, 34, 27, 23, 17, 13, 9, 6, 3 and 1.5 m^3/s respectively. Determine the ordinates of a 3 hr Unit hydrograph for the basin.

(b) Unit hydrograph ordinates of 4 hour are given below. Find out ordinates of 8 hour unit hydrograph.

Time(hr)	0	4	8	12	16	20	24	28	32	36
U.H.O.	0	17	28	42	72	60	47	32	15	0

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Describe the various structural methods adopted for control of floods. Also discuss the problem of floods and their control with special reference to the Indian scene.

(b) The peak values of the floods from the year 1941 to 1955 are 4000, 5400, 7000, 4600, 3800, 5800, 4900, 7800, 6400, 5300, 4700, 5200, 10000 and 5200 cumecs. Estimate the magnitude of flood having frequency equal to (i) 100 years, (ii) 300 years. The $\bar{y}_n = 0.5128$ and $S_n = 1.0206$.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Write short notes on following:
- (i) Specific capacity of well
- (ii) Well loss
- (iii) Spherical flow in well

(b) A 25 cm diameter well penetrates 20m below water table. After 1 day pumping at a rate of 4600 litre/minutes. The water level in attest well at 110m is lowered by 0.7m and test well at 40 m away drawdown is 1.25 m. What is the transmissibility of aquifer?

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