CE 210 Systems Techniques in Water Resources & Environmental Engg

Assignment - 3

1. A reservoir is to be constructed to supply water at a maximum constant rate per season for a city. The inflows in the six seasons of the year are 3, 12, 7, 3, 2 and 3 respectively. Determine the minimum required reservoir capacity using (i) Mass diagram method and (ii) Sequent Peak Method neglecting all losses.

   Solution: K=9.

2. Solve the following problem by using (i) Mass diagram method (ii) Alternate graphical method (iii) Sequent Peak Method and (iv) Linear Programming to estimate the reservoir capacity. (Neglect evaporation losses).

Period, t	1	2	3	4	5	6
Inflow, Qt	4	8	7	3	2	0
Demand, Dt (=Rt)	5	0	5	6	2	6

   Solution: K=10.

3. Solve the following problem by using Linear Programming to estimate the reservoir capacity. Monthly Inflows and demands are in Mm^3 and e_t in mm.

	June	July	Aug	Sept	Oct	Nov
Q_t	70.61	412.75	348.40	142.29	103.78	45.00
D_t	51.68	127.85	127.85	65.27	27.18	203.99
e_t	231.81	147.57	147.57	152.14	122.96	121.76

	Dec	Jan	Feb	Mar	Apr	May
Q_t	19.06	14.27	10.77	8.69	9.48	18.19
D_t	203.99	179.47	89.76	0	0	0
e_t	99.89	97.44	106.14	146.29	220.97	246.75

Reservoir data: Area at dead storage level, $A_0 = 37.01\ Mm^2$; Slope, $a = 0.117115$

   Solution: K=617.986 Mm^3.

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