VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test – II

Programme Name & Branch: B. Tech. (Civil Engineering)

Course Name & Code: Water Resources Engineering (CLE2004)

Faculty In charge: Dr. Dillip Kumar Barik

Class Number: 5192 **Slot:** B1 **Exam Duration:** 90 min **Maximum Marks:** 50

General instruction(s):

Open class note mode (No any printed materials are allowed)

Use normal graph paper. Assume necessary data if it is required.

(5 x 10 = 50 Marks)

S.No.	Question
1.	The storm over a catchment of 50 km² was having the following intensity: (i) 40 mm/h for 1 hour (ii) 70 mm/h for 2 hour (iii) 30 mm/h for 1 hour The 20 %, 60 % area of the catchment has Φ indices 10 mm/h and 15 mm/h respectively. The remaining area is impervious. Find the total runoff (Mm³) generated from the catchment.
2.	The diameter of the evaporimeter is 1.0 m. Evaporation measured from 8:00 AM to 6:00 PM in three different day from a catchment of 100 km²: (i) 9.56 lit of water added to the pan to maintain constant water level and no rainfall during this time. (ii) 5.0 lit of water taken out from the pan and precipitation during this time is 20 mm. (iii) 5.0 lit of water added to the pan and precipitation during this time is 10 mm. There is 2 lit of water leaked during this time. Find the volume of water (Mm³) evaporated and the rate of evaporation (mm/h) for the above days from the catchment.
3.	The inflow hydrograph in a particular section of river is given as follow:

Time (h)	0	1	2	3	4	5	6	7	8	9	10
Discharge (m³/s)	10	16	28	45	37	30	24	19	15	12	10

Route the hydrograph in the downstream side by using Muskinghum's method. Assume K and x as 4 hour and 0.3 respectively. Find peak attenuation and lag time.

4.	In a wheat crop field, irrigation water supplied at the rate of 20 litre per second. The length and width of the field are 250 m and 40 m respectively. Root zone depth of wheat crop is 60

cm. The field capacity of the soil is 22 % and permanent wilting point of the soil is 6.6 %. (a) Compute the depth of irrigation water requirement and (b) How long irrigation water to be supplied to the field to complete the irrigation for the above crop?

5. In a canal irrigation system, there are five different types of crops (wheat, sugar cane, cotton, rice and vegetables) have been grown in the command area. The base period, intensity of irrigation and duty at the field are as below:

Crop	Base Period (days)	Duty (ha/cumec)	Irrigation Intensity (ha)
Wheat	120	1800	4800
Sugar cane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
vegetables	120	700	1400

If the conveyance and reservoir losses are 20 % and 12 % respectively, find the reservoir capacity (Mm^3).

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