GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR (GIET UNIVERSITY)

B. Tech (Fifth Semester) Examinations, November – 2024

22BCVPC35002 – Water Resource Engineering

(Civil Engineering)

Time: 3 hrs   Maximum: 70 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A   (2 x 5 = 10 Marks)

Q.1. Answer *ALL* questions

		CO #	Blooms Level
a.	Define probable maximum precipitation.	CO2	K1
b.	As the rainfall supply continues, the rate of infiltration decreases, Why?	CO3	K3
c.	Define Spillway.	CO1	K1
d.	Differentiate between perennial and ephemeral stream.	CO1	K1
e.	What is the importance of specific energy diagram?	CO1	K2

PART – B   (15 x 4 = 60 Marks)

Answer *ALL* the questions

		Marks	CO #	Blooms Level
2. a.	Explain Hydrologic Cycle with neat sketch.	8	CO1	K1
b.	A 6 hr storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm/hr in successive one hour intervals in a basin of 800 sq.km. The resulting runoff is observed to be 2640 ha.m. Determine Ø- index for the basin.	7	CO2	K2

(OR)

		Marks	CO #	Blooms Level
c.	Explain briefly the dilution method of flow measurement. List the qualities of a good tracer for use in this method.	8	CO3	K2
d.	How do you measure evaporation using Pan and Water Budget Equation Method?	7	CO1	K1
3.a.	In a 4 hr. storm with 50 mm of excess rainfall from a basin, the flows in the stream were as follows :	8	CO2	K2

Time (hrs)	:	0	2	4	6	8	12	16	20
Flow (m^3/s)	:	0	1.22	4.05	6.75	5.67	3.35	1.35	0

Determine the ordinates of unit hydrograph. Estimate the peak flow and the time of its occurrence in a flood created by a 8 hr storm, which results in 2.5 cm of effective rainfall during the first 4 hours and 3.75 cm of effective rainfall during the second 4 hours. Assume the base flow as negligible.

		Marks	CO #	Blooms Level
b.	Differentiate between hydraulic and hydrological method of flood routing.	7	CO1	K1

(OR)

		Marks	CO #	Blooms Level
c.	Explain in detail about the various flood control measures and different types of droughts.	8	CO3	K3
d.	Rainfall of magnitude 3.8 cm and 2.8 cm occurring on two consecutive 4-h durations on a catchment of area 27 km2 produced the following hydrograph of flow at the outlet of the catchment. Estimate the rainfall excess and ϕ index.	7	CO2	K2

Time from start of rainfall (h)	-6	0	6	12	18	24	30	36	42	48	54	60	66
Observed flow(m3/s)	6	5	13	26	21	16	12	9	7	5	5	4.5	4.5

4.a. Derive Chezy's equation for open channel flow. 8 CO2 K2

b. Water is flowing a critical depth of a section in a trapezodial shaped channel with side slope of 0.5H:1V as shown in the figure. If the critical depth is 1.6m., estimate the discharge in the channel and specific energy at the critical depth. 7 CO2 K3

(OR)

c. Explain the procedure of deriving Synthetic unit hydrograph for a catchment by using Snyder's method. 8 CO1 K1

d. Explain single ring and double ring infiltrometer. 7 CO1 K1

5.a. Explain briefly S CURVE with an example. 8 CO1 K1

b. Define specific energy. Draw a neat sketch of specific energy curve for a rectangular channel showing all its details. 7 CO3 K2

(OR)

c. Derive the conditions of the most economical and efficient trapezoidal channel. 8 CO3 K2

d. Illustrate the reservoir routing and channel routing method. 7 CO1 K1

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