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VII SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, DEC-2020

SUBJECT: HYDROLOGICAL ANALYSIS (PROGRAM ELECTIVE) [CIE 4006]

REVISED CREDIT SYSTEM

(-12- 2020)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- Missing data may be suitable assumed.

1A.	What are the basic data required for hydrological studies? Name the agencies from which these data can be obtained?	05
1B.	Explain 'Maximum Depth Area Duration Curve' with a neat sketch.	05
2A.	Write a descriptive note on rainfall data representation.	06
2B.	One of four monthly-read rain gauges on a catchment area develops a fault in a month when the other three gauges record 37, 43 and 51 mm respectively. If the average annual precipitation amounts of these three gauges are 726, 752 and 840 mm respectively and of the broken gauge is 694 mm, estimate the missing monthly precipitation at the latter.	04
3A.	Discuss the different methods of estimating the evapotranspiration of a crop. Discuss the factors affecting evapotranspiration.	06
3B.	The total observed runoff volume during a storm of 6-hr duration with a uniform intensity of 15 mm/hr is 21.6 Mm^3. If the area of the basin is 300 km^2, find the average infiltration rate and the runoff coefficient for the basin.	04
4A.	Describe briefly the SCS-CN method of estimation of the catchment yield.	05

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4B. Compute the runoff volume due to a rainfall of 15 cm in a day on a 550 ha watershed. The hydrological soil groups are 50% of group C and 50% of group D randomly distributed in the watershed. The land use is 55% cultivated with good quality bunding and 45% waste land. Assume antecedent moisture condition of Type-III and use standard SCS-CN equations. Use the data given in the following table. — 05

Land Use	Cover		Hydrologic Soil Group			
	Treatment	Hydrologic Condition	A	B	C	D
Cultivated	Straight Row		76	86	90	93
Cultivated	Contoured	Poor	70	79	84	88
		Good	65	75	82	86
Cultivated	Bunded	Poor	67	75	81	83
		Good	59	69	76	79
Waste Land			71	80	85	88

5A. Explain the concept and significance of Unit Hydrograph? List out the assumptions involved in the Unit Hydrograph theory. — 05

5B. Describe the basic Muskingum method of routing an inflow flood hydrograph though a channel reach by assuming that the values of the coefficients **K & x** for the reach are known. — 05

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