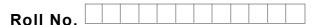
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B.Tech.(Civil Engineering) (2011 Onwards E-I & II) (Sem.–7,8) FLOOD CONTROL & RIVER ENGINEERING Subject Code : BTCE-816 M.Code : 71875

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a. Explain lateral movement of rivers and its bank instability.
- b. Difference between guide bank and spurs.
- c. Write short notes on :
 - i) River bed aggradation
 - ii) Armouring.
- d. What do you understand by resistance to flow?
- e. Explain free board.
- f. What do you mean by launching apron?
- g. Write a note on economic justification of flood control projects.
- h. What is the spacing of groynes?
- i. What do you mean by bar formation in alluvial rivers?
- j. What do you mean by resistance to flow?



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SECTION-B

2. The ordinates of a 3 hour unit hydrograph are given below :

Time in hr	0	3	6	9	12	15	18	21	24	27	30
Ordinates m ³ /sec	0	10	25	20	16	12	9	7	5	3	0

Find the ordinates of a 6 hour unit hydrograph for the same basin, analytically. Also sketch this unit hydrograph. What is the peak value of discharge in this unit hydrograph?

- 3. What do you understand by flood forecasting? Why flood forecasts are necessary in life, and how are they formulated?
- 4. What do you mean by spurs? Explain different types of spurs.
- 5. What are the uses and limitations of unit hydrograph theory?
- 6. Enumerate and briefly discuss the various methods that may be employed for controlling floods and also discuss the comparative merits and demerits of these methods.

SECTION-C

7. Using a 3 hr. unit hydrograph given below find the peak flow, resulting from four successive 3 hour periods of rainfall producing 0.38, 0.89, 1.42 and 0.75 cm of runoff respectively by from a basin.

Time in hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Flow in m ³ /s	0	15	56	169	332	435	395	280	210	161	120	90	59	32	15	0

- 8. What are the impacts of flooding on socio economic development and agriculture?
- 9. Estimate the sediment load in tonne at the proposed dam site in North India with the following data using various empirical equations :

Catchment area = 1839 sq. km

Width of reservoir at FRL = 560.0 m

River slope at the dam site = 0.006

Assume annual siltation rate per 100 sq. km from a similar catchment of 3050 sq. km to be $10.35 \text{ M.m}^3/100 \text{ sq.m.}$

Average inflows at the site are as follows :

Year	1982	1983	1984	1985	1986	1987	1988	1989	1990
Inflow M. m ³	2210	1290	1640	1780	2150	1980	2540	1285	1620

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.