

**M. TECH.-II (CIVIL-HYDRAULIC ENGINEERING) (CBCS
– 2015 COURSE) : WINTER - 2017**

SUBJECT : SEDIMENT TRANSPORT & RIVER ENGINEERING

Day : **Monday**
Date : **27/11/2017**

W-2017-2800

Time : **11.00 AM TO 02.00 PM**
Max. Marks : 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3 Use of non programmable **CALCULATOR** is allowed.
- 4) Answers to both the sections should be written in the **SEPARATE** answer books.

SECTION – I

- Q.1** a) Discuss the nature of sediment problem with respect to flood control measures using embankments. [05]
b) State and explain bulk properties of sediment. [05]

OR

- a) What are the different parameters by which sediment non-uniformity can be represented? [05]
b) Discuss the external forces/aspects that affect the fall velocity of sediment. [05]
- Q.2** a) Write a note on typical characteristics of ripples and dunes. [05]
b) Explain complexities involved in the estimation of flow regimes. [05]

OR

Explain Einstein and Barbarosa method to prepare stage discharge curve. [10]

- Q.3** a) Explain DuBoy's bed load equation and state its limitation. [05]
b) Explain the terms with sketches: [05]
i) Bed load ii) Suspended load iii) Saltation load iv) Wash load.

OR

Describe direct and indirect methods of measurement of Sediment load.

SECTION – II

- Q.4** Design an irrigation channel to carry discharge $40\text{m}^3/\text{s}$. Assuming Kennedy's theory. Take $S = 1/4000$, $m = 1$, $N = 0.022$, side slope $0.5H : 1V$. [10]

OR

What is meant by channel in Regime? Explain briefly theory presented by Lacey for the design of stable channel. [10]

- Q.5** Explain the difference between the "Local Scour" and "Degradation" in a river; their causes and impacts. [10]

OR

List out the different causes for the development of river meanders and explain the phenomenon of the helical flow at a bend with the help of suitable diagrams. [10]

- Q.6** Explain the role of the Berm and Toe wall in a revetment constructed for river bank protection works. Use sketches wherever required. [10]

OR

A dam is construed across river A and the stored water is diverted to river B by maintaining a constant flow throughout the year. Estimate the likely morphological changes in the river B, in the reach downstream of the inflow coming from the river A. [10]

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