Total No. of printed pages = 2

19/2nd Sem/PCEW 202

2022

HYDRAULICS OF SEDIMENT TRANSPORT

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer *all* questions.

1. Write in details (draw the figure, if necessary) : 5×4=20

   (a) Total load transport

   (b) Concept of meandering

   (c) Scour below drop structures

   (d) Characteristics of Saltation.

2. (a) Discuss the various modes of sediment transport (draw the figure, if necessary). 8

   (b) Derive the mathematical expression for advection-diffusion equation of suspended sediment motion. 12

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3. (a) Write in details about the various types of bedforms. Draw the necessary figures. 12

(b) Determine the terminal fall velocity w_s in water for a spherical particle with diameter of 5 mm. The relative density of sediment is measured as 2.65. Consider $g = 9.81$ m/s^2 and ν for a clear water $= 10^{-6}$ m^2/s. 8

4. (a) Derive the governing equation for threshold bed shear stress on a streamwise sloping bed. 15

(b) What do you mean by threshold velocity ? 5

5. (a) Write in details of Continuity equation of sediment transport. 8

(b) Discuss Du Boys approach in details for bed load transport. 12