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1   Having the sediment distribution obtained in Assignment #1 and assuming an average velocity of 0.5 m/s, calculate the fall velocity and the critical shear stress using different methods. Explain the reasons behind the differences.

2   As you know, it is difficult in the experiment to define precisely at what flow condition a sediment particle will begin to move (Incipient motion). Use the materials available in books, internet, etc., write a summary about the experimental criteria used by different investigators to measure the incipient motion parameters. Comment on the engineering applicability of the proposed criteria.

3   Having the sediment distribution given below and the following data, obtain the stage-discharge data for a trapezoidal channel using the method proposed by Engelund and Hanson. Compare the results with ones using Manning equation. Explain the reasons behind the differences. Choose any necessary data not listed below.

$$S_0 = 0.0002 \quad ; \quad B = 30 \text{ m} \quad ; \quad m_s = 2$$

Class No.	Class Range (mm)	d_i (mm)	$i_{b\,(\%)}$	Finer (%)
1	0.06-0.10	0.08	0.1	0.1
2	0.10-0.30	0.20	0.13	0.23
3	0.30-0.5	0.4	0.34	0.57
4	0.5-1.0	0.75	0.2	0.77
5	1.0-2.0	1.5	0.1	0.87
6	2.0-4.0	3	0.05	0.92

D (m)	0.5	1.0	2.0
Q (m³/s)			