Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–II • EXAMINATION – SUMMER - 2017

Subject Code: 2723304 Date: 29/05/2017

Subject Name: Fluvial Hydraulics

Time: 02:30 PM To 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define the following terms in relation with sediment with their expression and explain how you will determine it. (1) Arithmetic mean size (2) geometric mean size (3) Kramer's coefficient (4) Median size	**07**
	(b)	Determine the bed load transport of a uniform sediment having median size =0.8 mm flowing in a wide channel of width =1.2 m and depth of flow = 0.2 m, and carrying discharge = 0.6 m^3/s. Take slope of channel = 0.0004. Use Mayer Peter-Muller equation to compute bed load.	**07**
Q.2	**(a)**	Describe Shield's criterion (with figure) to determine the incipient motion condition of sediment.	**07**
	(b)	Define various approaches to compute bed load in a channel.	**07**
		OR	
	(b)	Define following with figure (1) Bed load (2) saltation load (3) Contact load (4) Suspended load (5) Wash load (6) Total load	**07**
Q.3	**(a)**	Explain various regimes conditions (with figure) in an alluvial channel.	**07**
	(b)	Write a detailed note on velocity distribution in an alluvial channel.	**07**
		OR	
Q.3	**(a)**	A wide rectangular channel having coarse material of size 2.0 mm carries a unit discharge of 4.0 m^3/s/m under incipient motion condition. Using shield's method to calculate the depth of flow and the longitudinal slope of the channel.	**07**
	(b)	Explain hydraulic radius of bed and procedure to calculate it.	**07**
Q.4	**(a)**	Explain the suspended sediment distribution equation and procedure to obtain the concentration profile of suspended load.	**07**
	(b)	Describe aggradation and degradation in an alluvial channel. Explain causes and remedial measures of these.	**07**
		OR	
Q.4	**(a)**	Explain different types of scour with figure. Describe various scour protection devices.	**07**
	(b)	Calculate the suspended load transport in river carrying uniform sediment of 0.1 mm size. River is 6 m wide and has 3.0m water depth and flowing at a bed slope of 0.0002.	**07**
Q.5	**(a)**	Explain the procedure of computing fraction-wise calculation of bed load transport rate in the case of non-uniform sediments.	**07**
	(b)	Write short note on (1) Bed load sampling (2) Suspended load sampling	**07**
		OR	
Q.5	**(a)**	Define (1) Initial regime (2) Final regime (3) Permanent regime in the case of channel in alluvial soil. Write a short note on stable channel.	**07**

(b) Explain reservoir sedimentation with the measures to control it. **07**

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