GUJARAT TECHNOLOGICAL UNIVERSITY
ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2723304   **Date: 27/05/2016**

Subject Name: Fluvial Hydraulics

Time:10:30 am to 01:00 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)**	Explain the phenomenon of aggradation and degradation with a suitable sketch.	**07**
	(b)	Explain the following terms in detail (1) Bed load (2) Suspended load (3) Total load (4) Wash load	**07**
Q.2	**(a)**	Explain the various approaches used to establish the incipient motion of sediment.	**07**
	(b)	Explain Shield's curve with its range of validity. Also explain the procedure to compute critical tractive shear stress for given particle size.	**07**

OR

	(b)	Explain the following (1) Ripple and dune regime (2) Transition regime (3) Anti-dune regime	**07**
Q.3	**(a)**	Explain with figure uniform and non-uniform sediments. Describe hiding and exposure effects in the case of non-uniform sediments.	**07**
	(b)	Uniform sediment of median size equal to 2.8 mm is flowing in a channel of 1.0 m width with a flow depth of 12 cm. Find the shear stress induced by flow if the bed slope is 0.004. Also check whether sediment will move under this stress or not? Take kinematic viscosity of water = 1×10^{-6} m^2/s.	**07**

OR

Q.3	**(a)**	Discuss various equations to estimate the rate of bed load transport in a mobile boundary channel.	**07**
	(b)	Compute the bed load transport rate for a channel carrying a flow rate of 70 l/sec with a flow depth of 12 cm and slope of 0.005. The width of channel is 0.50m. Use grain shear method to compute bed load transport. The uniform sediment has a median size of 2.4 mm.	**07**
Q.4	**(a)**	Describe the procedure to obtain suspended load concentration of a river when you collect a sample from it.	**07**
	(b)	Explain the integration of sediment distribution equation to obtain concentration profile of suspended load.	**07**

OR

Q.4	**(a)**	Compute the suspended load transport rate in a stream of 100 m width with a flow depth of 2.0m and slope of 0.0005. The uniform sediment has a median size of 0.4 mm.	**07**
	(b)	What is hydraulic radius of bed? Explain the Einstein's method of calculating the hydraulic radius of bed.	**07**
Q.5	**(a)**	Explain the design procedure of stable channel.	**07**
	(b)	Write a short note on (1) Local scour around pier and abutment (2) Bank protection	**07**

OR

Q.5	**(a)**	Write a shore note on (1) Bed load sampling (2) Suspended load sampling	**07**
	(b)	Explain reservoir sedimentation with a sketch and measures to control it.	**07**