Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015

Subject Code: 2150602 **Date:05/12/ 2015**

Subject Name: Hydrology and Water Resources Engineering

Time:10:30am to 1:00pm **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 non-recording type raingauge (Symon's raingauge) with neat sketch. How will you find out missing rainfall data?	**07**
	(b)	Define 'Drought'. Distinguish between hydrological drought and meteorological drought. Describe, in detail, measures for water conservation and augmentation of water resources.	**07**
Q.2	**(a)**	Explain the mass curve method that can be used for determining reservoir capacity.	**07**
	(b)	Discuss various methods of determining the average depth of rainfall over a catchment.	**07**
		OR	
	(b)	In a certain river basin, there are four raingauge stations, with their normal annual precipitation amounting to 800, 520, 450 and 390 mm, respectively. Determine the optimum number of raingauges in the catchment, if it is desired to limit the error in the mean value of rainfall in the catchment to 10 %.	**07**
Q.3	**(a)**	Explain the recuperation test to estimate the safe yield of an open well.	**07**
	(b)	Discuss the characteristics of the flow duration curves and write its various uses.	**07**
		OR	
Q.3	**(a)**	Define unit hydrograph? How it is constructed? Write assumptions and limitations of the unit hydrograph.	**07**
	(b)	A well penetrates fully a 10 m thick water bearing stratum of medium sand having coefficient of permeability of 0.004 m/sec. The well radius is 100 mm and is to be worked under a drawdown of 4 m at the well face. Calculate the discharge from the well. What will be the percentage increase in the discharge if the radius of the well is doubled? Take R = 300 m in each case.	**07**
Q.4	**(a)**	Explain reservoir sedimentation. What are the procedures for determining the useful life of a reservoir?	**07**
	(b)	What factors affect the selection of type of dam? Discuss them briefly.	**07**
		OR	
Q.4	**(a)**	What is reservoir planning? Describe briefly various investigations required for reservoir planning.	**07**
	(b)	Define following terms: (i) Firm Power, (ii) Load Factor, (iii) Gross Head, (iv) Operating Head, (v) Design Head, (vi) Plant Factor, (vii) Secondary Power.	**07**
Q.5	**(a)**	Enlist various methods of flood estimation. Describe flood frequency analysis.	**07**

	(b)	A coffer dam designed for a 22 years flood is constructed. It takes 6 years to complete the construction of main dam. What is the risk that the coffer dam may fail before the end of the construction period? What return period in the design of coffer dam would have reduced the risk to 12% ?	**07**

OR

Q.5	**(a)**	Discuss modified Pul's method of reservoir routing.	**07**
	(b)	What is flood management? Explain flood damage analysis.	**07**

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