

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1721206****Date: 12/07/2012****Subject Name: Stochastic Models in Water****Time: 10:30 am – 13:00 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) Differentiate between stochastic and deterministic models. Give the suitability of each in hydrological processes. 07
- (b) Explain calibration of hydrologic models through suitable examples. 07

- Q.2 (a) Discuss the use of frequency analysis in assessing the characteristics of errors in a temporal model. 07
- (b) Discuss the implications of using a moving average filter in which the weights do not sum to 1. 07

OR

- (b) Consider a time series based on the *sine* function: $Y(t) = 20 + \sin t$, in which t is an angle measured in degrees. Assume that the time series is available at an increment of 30 degrees. Calculate the smoothed series for smoothing intervals of 3 and 5, and discuss the results. 07

- Q.3 (a) What model components would be necessary for a model to be capable of simulating the effects of watershed change? 07
- (b) Describe a general purpose simulation model of stochastic hydrology. 07

OR

- Q.3 (a) Differentiate continuous and discrete probability distribution. Explain any one method for each. 07
- (b) Explain multiple linear regression and its components. 07

- Q.4 (a) Describe a stochastic experiment that would determine if a regression model is not biased. 07
- (b) Justify the use of word 'model' to describe the peak discharge rational method, $Q_p = C_i A$. 07

OR

- Q.4 (a) The power model form $y = ax^b$, is widely used in hydrologic modeling. Discuss whether it can be a conceptual model of a hydrologic process or only an empirical prediction equation. 07
- Q.4 (b) Explain non-stationary time series with examples. How modeling of such series is done. 07

- Q.5 (a) Explain in brief AR model 07
- (b) Explain in brief MA model 07

OR

- Q.5 (a) Explain in brief ARMA model 07
- (b) Explain in brief ARIMA model 07
