In recent years, artificial neural networks (ANN) have became one of the most promising tools in order to model complex hydrological processes such as the rainfall-runoff process. In this study, the ANN models have been applied for daily stream flow forecasting and the forecasting ability has been tested. Those are the feed-forward back-propagation (FFBPNN), cascade-forward back-propagation (CFBPNN) and nonlinear auto regressive with exogenous inputs (NARXNN). The three ANN models were used to forecast daily flow rate for lead periods of one to seven days. Upper Bernam river basin in Malaysia was selected as the study area. Observed daily rainfall and flow rate were used as input data for all three models. The FFBPNN model with ten neurons in hidden layer gave the best performance. The best structure for NARXNN is a network with five neurons in hidden layer and the best for CFBPNN is with five neurons in hidden layer. The FFBPNN10-1model is the best performer in forecasting stream flow rate for periods of one to seven days lead. The results, for one day period lead forecasting are as follows: R2 = 0.92, MSE = 73.9, MAE = 5.42 and NS = 0.92 during training; R2 = 0.92, MSE = 70.03, MAE = 5.61 and NS = 0.92 during testing. The performance becomes less accurate when the period of forecasting lead day is added. In general, the results show that the FFBPNN model yields the best performance in forecasting daily flow rate for one to seven days lead. The FFBPNN model is clearly more efficient to be used compared to the CFBPNN and NARXNN and it is a viable tool for flow rate forecasting