**ABSTRACT**

Concrete is the sustainable construction material, which is most widely used in the world as it provides superior fire resistance, gains strength over time and gives an extremely long service life. Its annual consumption is estimated between 21 and 31 billion tones. The paper is aimed at guiding the selection of available materials and proportioning them as to produce the most economical concrete suitable for the desired purpose. According to the National Council for Cement and Building Materials (NCBM), New Delhi, the compressive strength of concrete is governed generally, by the water-cement ratio. The mineral admixtures like fly ash, ground granulated blast furnace, silica fume and fine aggregates also influence it. The main purpose of this paper is to find the accuracy for the compressive strength of high performance concrete by using classification algorithms like Multilayer Perceptron, Rnd tree models and C-RT regression. The result from this study suggests that tree based models perform remarkably well for designing the concrete mix.