MATH48181/68181: EXTREME VALUES
FIRST SEMESTER
IN CLASS TEST - 17 DECEMBER 2021

QUESTION Suppose $X_1, X_2, \ldots, X_n$ is a random sample with cumulative distribution function $F(\cdot)$. State the Extremal Types Theorem for $M_n = \max(X_1, X_2, \ldots, X_n)$. You must clearly specify the cumulative distribution functions of each of the three extreme value distributions.   (1 marks)

State in full the necessary and sufficient conditions for $F(\cdot)$ to belong to the domain of attraction of each of the three extreme value distributions.   (1 marks)

Consider a class of distributions defined by the cumulative distribution function

$$F(x) = 1 - [1 - G(x)]^{G(x)}$$

where $G(\cdot)$ is a valid cumulative distribution function. Show that F belongs to the same max domain of attraction as G. You may assume that F and G have the same upper end points. (8 marks)