Assignment 2
Wireless Networks
Full marks: 15

Q1. Create a topology of N WiFi clients using NS-3 simulations, the clients are connected to an AP. The AP is connected to a server through p2p links. Specify the p2p link's bandwidth to 1000Mbps and delay to be 100ms. (Hint: example third.cc https://www.nsnam.org/doxygen/d2/db5/third_8cc_source.html) . The nodes do not have any mobility. The nodes run under fixed MCS [4]

a. Create two IP subnets, one for WiFi networks and another for the p2p network. (Hint: example third.cc https://www.nsnam.org/doxygen/d2/db5/third_8cc_source.html) [2]
b. Let all the clients download a 5MB file from the server. Compute the completion time of each client (completion time is defined as the time difference between the request sending time and when the last byte of 5MB download comes), plot the completion time of each client. (Hint: Figure out which application to use) [3]
c. Now, along with the download let the clients also run an upload application with upload rate of 100-200Kbps. Compute the completion time. Do you observe any differences, explain. (Hint: Figure out which application to use) [2]
d. Now change your simulation to have a path loss and fading model, and select MistrelHTManager as the rate adaptation manager. Perform step c, what results do you obtain, explain the differences (Hint: https://www.nsnam.org/doxygen/d8/dfd/wifi-rate-adaptation-distance_8cc.html) [2]
e. Now change your simulation to turn on RTS/CTS, what changes do you observe explain. [2]

Submit your code for a-e, creating separate files for each, while showing demo you should be able to run any of these files that the TA asks you to show.
Submit all the code files, along with the report, and submit a zip file containing all.