

ITS413 – Quiz 3

Name: _____

ID: _____

Mark: _____ (out of 5)

Question 1 [marks]

Calculate the maximum possible throughput if a single IEEE 802.11 wireless LAN AP always has many frames to send to a single IEEE 802.11 wireless LAN client. You should assume:

- No other stations within range to interfere with the transmissions.
- No transmission errors.
- Only the AP is sending to the client (client is not sending data to AP).
- Integer backoff slots are chosen randomly from $(0, CW]$ which means greater than 0 and less than or equal to current value of CW.
- IEEE 802.11 parameters as in table below.
- Assume the RTSThreshold is set such that all frames use the scheme given in the table.

Parameter	Value
Data Rate	10Mb/s
Scheme	RTS/CTS
Header size of DATA	40 bytes
Payload size of DATA	960 bytes
Time for ACK, RTS, CTS	100 μ sec
Slot Time	20 μ sec
SIFS	10 μ sec
DIFS	50 μ sec
CWmin	9
CWmax	159

(These values do not match the real IEEE 802.11 values, but instead are chosen to make your calculations easier).

In your answer, draw a diagram illustrating the steps in the frame transfer. Show all your calculations. Diagram worth 1 mark; calculations and correct answer worth 4 marks.