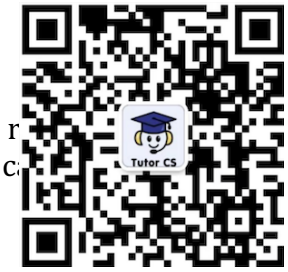
COMP4336/9336 Mobile data networking
W10 Quiz: All contents



1. An FMCW r[illegible] resolution of 150mm. Which of the following statements c[illegible]

a.
The radar chirps sweep from 24GHz-25GHz
b.
The radar chirps sweep from 79GHz-80GHz
c.
The radar chirps sweep from 77GHz-78GHz
d.
The radar chirps sweep from **79GHz-81GHz**
e.
The radar chirps sweep from 60GHz-61GHz

A. Resolution = c/2B, which says that the available bandwidth is only 1GHz if resolution is 150mm.

2. In Bluetooth, the 3b member address is used to identify the

a.
Active devices
b.
Piconet
c.
Both active and parked devices
d.
Scatternet
e.
Parked devices

A. 3b address is used to identify the active devices; when an active device becomes a parked device (going to sleep for a while, for example), its 3b address is taken away from it.

3. Protocol A has four times the data rate of Protocol B but consumes three times as much power. Which protocol has less energy consumption per MB (mega byte)?

a.
None of these
b.
Protocol B

c.
Both protocols have the same energy consumption
d.
Protocol A

A. Energy cons[illegible]d amount of data = time to transmit the data x power

Time to trans[illegible]portional to data rate

We have ¾, which is less than 1, so Protocol A consumes less energy than Protocol B.

4. For a 500kHz channel, all data transmitter configured with SF=8 can send

a.
More than 1500 symbols per second but less than 1900 symbols per second
b.
More than 1900 symbols per second but less than 2000 symbols per second
c.
More than 2000 symbols per second
d.
More than 1000 symbols per second but less than 1900 symbols per second
e.
More than 2000 symbols per second but less than 2500 symbols per second

A. Symbol rate = 1/symbol_duration
Symbol duration = $2^{SF}/B$
So, symbol rate = $B/2^{SF}$ = 500kHz/2^8 = ~1953 symbols per second

5. How many successive unsuccessful transmission attempts are required for the Congestion Window (CW) variable to reach its maximum value in an 802.11n WLAN operating in the 5 GHz band?

a. 7
b. 6
c. 3
d. 5
e. 4

A. We have CW_min = 15, CW_max = 1023
After initialization, CW = CWmin = 15
After 1st unsuccessful attempt, CW = min(31,1023) = 31
After 2nd unsuccessful attempt, CW = min(63,1023) = 63
….

6. Consider an 802.11a WLAN. A station estimates the transmission times of RTS, CTS, and ACK as 16 µs, 16 µs, and 25 µs, respectively. After receiving the RTS, the

AP generates a CTS. What would be the value of the Duration field in the CTS header if the station wanted to send a 250 µs long data frame?

a.
400µs
b.
323ms
c.
355µs
d.
339µs
e.
323µs

7. In a cellular deployment, assume that the distance between co-channel cells is required to be at least 6 km. What is the minimum cell radius allowed for the cluster size of 12?

a.
3km
b.
200m
c.
500m
d.
2km
e.
1km

8. What is the resolution of an FMCW radar utilising the frequency band 77GHz-79GHz?

a.
7.5mm
b.
None of these
c.
75mm
d.
7.5cm
e.
75cm

A. The correct answers are 75mm and 7.5cm.

9. To cover all directions (360 degrees), an 802.11ad PCP/AP employs two 10-sector antennas. Each antenna sector covers 18 degrees. During a Beacon Time (BT), how many beacons the AP should transmit?

a.
18
b.
2
c.
10
d.
38
e.
20

10. A telephone line is known to have a loss of 15 dB. The input signal power is measured at 1 Watt, and the output signal noise level is measured at 1 dBm. What is the signal to noise ratio in dB?

a.
1
b.
100
c.
10
d.
-10
e.
-100

A. No correct answer here. The correct answer should be 14.

End of W9 Quiz