

COMP4336/9336 Mobile data networking
W10 Quiz: All contents

1. An FMCW radar has a range resolution of 150mm. Which of the following statements cannot be true?

- 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 resolution is 1GHz if

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

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- 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 consumption for a fixed amount of data = time to transmit the data \times power

Time to transmit is inversely proportional to data rate

We have $\frac{3}{4}$, which is less than 1, so Protocol A consumes less energy than Protocol B.

4. For a 500kHz channel, a LoRa 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 sy

e.

More than 2000 symbols per second but less than 2

- A. Symbol rate = $1/\text{symbol duration}$

Symbol duration = $2^{\text{SF}}/B$

So, symbol rate = $B/2^{\text{SF}} = 500\text{kHz}/2^8 = \sim 1953$ 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 $\text{CW}_{\min} = 15$, $\text{CW}_{\max} = 1023$

After initialization, $\text{CW} = \text{CW}_{\min} = 15$

After 1st unsuccessful attempt, $\text{CW} = \min(31, 1023) = 31$

After 2nd unsuccessful attempt, $\text{CW} = \min(63, 1023) = 63$

....

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 μ s long data frame?

- a. 400 μ s
- b. 323ms
- c. 355 μ s
- d. 339 μ s
- e. 323 μ s

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

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8. What is the resolution of an FMCW radar u 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

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A. No correct answer here. The correct answer is

End of W9 Quiz **Add WeChat edu_assist_pro**