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Question 1 (10 points) ✓ Saved

An RFID reader typically contains:

- ☐ Mouse
- ☒ Receiver
- ☒ Control Unit
- ☒ An antenna
- ☐ Laser Pointer
- ☒ Transmitter
- ☒ Display Unit
- ☐ Camera

Question 2 (7 points) ✓ Saved

Which one of the following is not required in a passive RFID tag?

- ☐ an antenna
- ☒ battery
- ☐ power supply circuit
- ☐ microchip

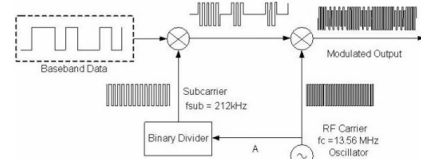
Question 3 (7 points) ✓ Saved

Anti-collision allows:

- ☐ to communicate a tag with other similar tags.
- ☒ to communicate a tag when other similar to tags are simultaneously visible to the reader.
- ☐ different types of tags to be read/write simultaneously.
- ☐ to communicate a reader with other similar readers.

Question 4 (10 points) ✓ Saved

Figure shows the block diagram of a modulator used in an RFID tag with the signals shown at all stages. In this diagram, the baseband data is modulated onto the sub-carrier. The RF carrier frequency ( $f_c$ ) of this system is 13.56 MHz. Match the following items with the given list at the right.

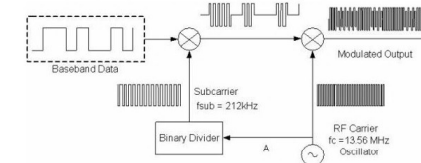


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Question 4 (10 points) ✓ Saved

Figure shows the block diagram of a modulator used in an RFID tag with the signals shown at all stages. In this diagram, the baseband data is modulated onto the sub-carrier. The RF carrier frequency ( $f_c$ ) of this system is 13.56 MHz. Match the following items with the given list at the right.



- |   |                                     |                        |
|---|-------------------------------------|------------------------|
| 6 | Frequency Band of subcarrier        | 1. $2^6$               |
| 3 | Subcarrier Frequency                | 2. RF Carrier          |
| 5 | Frequency Band of RF carrier        | 3. 212 kHz             |
| 4 | RF Carrier Frequency                | 4. 13.56 MHz           |
| 1 | The value of binary divider         | 5. HF (High Frequency) |
| 2 | What is the signal that labelled A? | 6. LF (Low Frequency)  |

Question 5 (7 points) ✓ Saved

Using odd parity, for E3h (11100011b). This gives the parity bit to be:

- ☐ 1
- ☒ 0
- ☐ -1
- ☐ +1

Question 6 (7 points) ✓ Saved

An RFID system may consist of:

- ☐ barcodes
- ☒ RFID readers
- ☐ barcode readers
- ☒ RFID tags

Question 7 (10 points) ✓ Saved

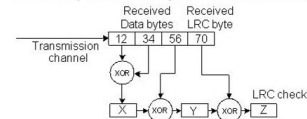
Figure shows the three data bytes (12, 34 & 56) and the LRC byte (70) which were

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Question 7 (10 points) ✓ Saved

Figure shows the three data bytes (12, 34 & 56) and the LRC byte (70) which were received by an RFID transponder. Match the following items with the given list at the right.



- |   |                 |             |
|---|-----------------|-------------|
| 1 | The value of X  | 1. 26       |
| 3 | Since Z = 00    | 2. 00       |
| 4 | The value of Y  | 3. No error |
| 2 | The values of Z | 4. 70       |

Question 8 (7 points) ✓ Saved

Near-field RFID systems employ \_\_\_\_ of tag to the \_\_\_\_ circulating around the reader antenna.

- ☐ radiative coupling, reactive energy
- ☐ inductive coupling, real energy
- ☐ radiative coupling, real energy
- ☒ inductive coupling, reactive energy

Question 9 (7 points) ✓ Saved

A passive RFID tag contains:

- ☐ an electronic microchip which includes a micro controller, memories and a transceiver
- ☒ all the options
- ☐ an antenna
- ☐ power supply circuit

Question 10 (7 points) ✓ Saved

Which one of the following codes is suitable for data transfer from the transponder to the reader?

- ☐ NRZ code
- ☒ Manchester code
- ☐ Unipolar RZ code

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Question 10 (7 points) ✓ Saved

Which one of the following codes is suitable for data transfer from the transponder to the reader?

- ☐ NRZ code
- ☒ Manchester code
- ☐ Unipolar RZ code
- ☐ Modified Miller coding

Question 11 (7 points) ✓ Saved

Near-field coupling techniques are generally applied to RFID systems with relatively short reading distances well within the radian sphere defined by:

- ☒  $\frac{\lambda}{2\pi}$
- ☐  $\frac{\lambda}{2}$
- ☐  $\frac{2\pi}{\lambda}$
- ☐  $\frac{2}{\lambda}$

Question 12 (7 points) ✓ Saved

Signal coding is a process that involves:

- ☐ Demodulation
- ☐ Error detection
- ☒ Representation of transmitted message to its voltage representation
- ☐ Modulation

Question 13 (7 points) ✓ Saved

Which one of the following frequencies is the most suitable frequency as a subcarrier to be used in the 13.56 MHz inductively coupled RFID system?

- ☐ 240 kHz
- ☐ 400 kHz
- ☐ 410 kHz
- ☒ 424 kHz