2.3 QKD Quiz - QKD with noise (Session: July 5) results for Mirza Akbar Ali

ⓘ Correct answers are hidden.

Score for this attempt: **8** out of 15
Submitted 12 Jul at 7:23
This attempt took 21 minutes.

Incorrect

Question 1

0 / 1 pts

In BB84, if both Asja and Balvis use X-basis and Espian uses **X**- or **Z**-basis randomly, what's the percentage that Balvis' bit string matches with that of Asja?

- ○ 75 %
- ○ 100 %
- ○ 25 %
- ◉ 50 %

Question 2

1 / 1 pts

In Privacy Amplification, Asja and Balvis pair up their bits by agreed random permutation and announce the addition modulo 2 of their paired bits.

- ○ True
- ◉ False

Incorrect

Question 3

0 / 1 pts

Asja and Balvis pair up their bits by agreed random permutation. BB84 is secure only if this random permutation is kept secret.

- (•) True
- ( ) False

Question 4

1 / 1 pts

In BB84, Espian never uses the same basis as Asja and Balvis.

- ( ) True
- (•) False

Incorrect

Question 5

0 / 1 pts

If initial bit string is: 11011010, then according to the convention in the notebooks, parity bit is

- ( ) 1
- (•) 0

Question 6

2 / 2 pts

You want to send only one bit of information: '0'.

Using the convention of adding a parity bit 1 for odd count of 0's, let's add a parity bit '1' and send "01" to recipient. For noisy channel, recipient may receive:

- 00
- 11
- All of these
- 01
- 10

Incorrect

Question 7

0 / 1 pts

You want to send only one bit of information: '0'.

Using the convention of adding a parity bit 1 for odd count of 0's and parity bit 0 for even count of 0's, let's add a parity bit '1' and send "01" to recipient. Which of the following options results in accepting a string with an error?

- 00
- 10
- 11
- 01

Incorrect

Question 8

0 / 1 pts

Error correction and privacy amplification can work if Asja and Balvis each use their own permutations.

- (●) True
- ( ) False

Question 9

1 / 1 pts

In BB84, Asja can prepare copies of the qubit that she is sending to Balvis and send all copies to Balvis, thus increasing Balvis' probability of receiving it and keeping the security as well.

- ( ) True
- (●) False

Question 10

1 / 1 pts

In BB84, if Asja and Balvis both use Z-basis and Espian uses X- or Z-basis randomly, Espian can receive how much information correctly?

- (●) 50 %
- ( ) 100 %
- ( ) 75 %
- ( ) 25 %

Unanswered

Question 11

0 / 2 pts

Complete the following code that allows Espian to intercept and measure qubits using a 16-bit quantum circuit:

```
qreg = QuantumRegister(16)
creg = ClassicalRegister(16)
espian = QuantumCircuit(qreg, creg, name='Espian')

for i in range(16):
    #YOUR CODE HERE#
    if m==0:
        espian.measure(qreg[i],creg[i])
        espian_basis.append('Z')
    else:
        espian.h(qreg[i])
        espian.measure(qreg[i],creg[i])
        espian_basis.append('X')
```

Make sure to enter the answer as per the correct syntax and avoid unnecessary spaces.

Question 12

2 / 2 pts

Espian is trying to intercept a conversation. We already have a random list of 0 and 1's (a total of 24 values) and it's denoted by 'k'. Complete the following code that allows Espian to intercept and measure qubits using a 24-bit quantum circuit:

```
qreg1 = QuantumRegister(24)
creg1 = ClassicalRegister(24)
espian = QuantumCircuit(qreg1, creg1, name='Espian')

for m in range(24):
  if k==0:
        espian.measure(qreg1[m],creg1[m])
        espian_basis.append('Z')
  else:
        #YOUR CODE HERE#
        espian.measure(qreg1[m],creg1[m])
        espian_basis.append('X')
```

Make sure to enter the answer as per the correct syntax and avoid unnecessary spaces.

espian.h(qreg1[m])

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