

Physics III
Homework Seven
Due Friday 4 June, 2010

1. Encrypt the following plaintext message THE BEARS ARE VERY SAD. For the key, use the description for course HS787, *Psychology and Social Factors for Carnivore Preservation*. (The description can be found in the list of new courses, available at http://www.coa.edu/assets/registrar/new_courses_fa10.pdf.)
2. Decrypt the following message: DFRKX TGJJH TJLZB HOIG. The key is the description for course HS788 *Futures Studies*.
3. A message was sent using the one-time pad shown below. The coded message is QCZDICIJTBEHXNZZ. What is the decoded message? Show at least some of your work to make it clear how you're decoding the message.

9	2	4	25	8	22
17	5	19	18	12	3
22	1	21	8	11	20
2	2	19	6	20	9
0	5	21	7	13	10

4. Alice and Bob are using an EPR experiment to distribute a key for a cipher using the protocol we discussed in class and described in chapter 13 of Styer's book. Alice observes:

$$A_1 B_1 B_0 A_0 C_0 \quad B_0 A_1 B_0 B_1 C_1 \quad A_1 A_0 C_1 C_0 B_0 \quad C_1 B_1 A_0 A_0 A_1 \quad (1)$$

While Bob observes:

$$B_0 B_0 C_0 C_1 A_1 \quad B_1 C_0 B_1 B_0 A_0 \quad C_1 B_1 C_0 B_0 C_0 \quad A_1 B_0 A_1 C_0 C_0 \quad (2)$$

What key would Alice and Bob end up using? Was Eve listening in? How can you tell?