



**King Fahd University of Petroleum & Minerals**  
 Electrical Engineering Department  
 EE430: Information Theory and Coding (072)  
**Quiz 2: Huffman Coding**

Serial # \_\_\_\_\_  
 - 2 points for not writing your serial number

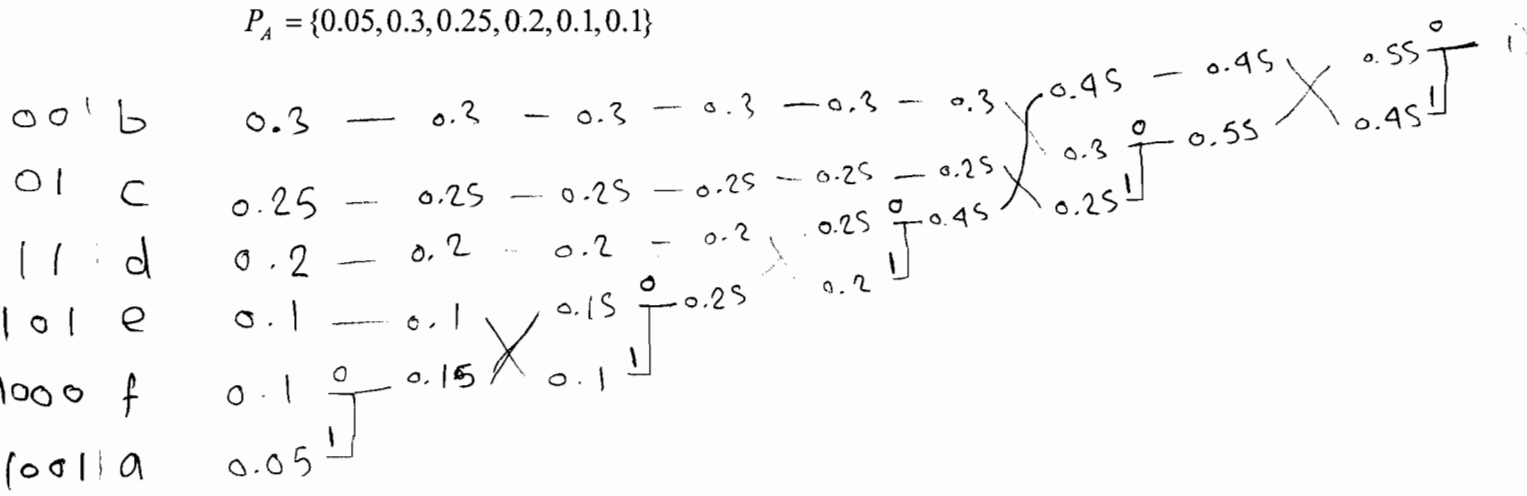
Name: \_\_\_\_\_

1- Is the following a valid Huffman code and why?  
 $C = \{11, 00, 011, 111\}$

No, because the code word  $11$  is a prefix of another code word  $111$

2- Design a Huffman code for the following alphabet and find the average code-word length :

$A = \{a, b, c, d, e, f\}$   
 $P_A = \{0.05, 0.3, 0.25, 0.2, 0.1, 0.1\}$



Symbol	a	b	c	d	e	f
Code-word	1001	00	01	11	101	1000

1010    11    01    00    100    1011

Other possible solutions:

or flip 0 ↔ 1

The average code-word length =  $2(0.3+0.25+0.2) + 3(0.1) + 4(0.1+0.05)$   
 $= 2.4$  bits/symbol