

CS 280 GRADING GUIDE

Sec 4.1

Q22) 2 marks for each part, 6 marks in total

This is a relatively simple question. However, some people made the wrong assumption, thinking that the decimal string does not start with 0. This is not true, but we still awarded some credit to such an answer.

Q38) 2 marks for each part, 6 marks in total

Many people had difficulties with this question because they missed out counting some cases that can possibly occur.

For example in 38c), some just took the answer to be $8*7*6*5*4$. They did miss out the fact that the groom/bride can be arranged in any of the positions from 1-6 when the people are lined in the row. Furthermore, the position can be occupied by either the bride or groom. Thus the correct answer is to multiply $8*7*6*5*4$ by 6 (anywhere from position 1-6) and by 2 (can be either bride or groom).

Sec 4.2

Q10) 4 marks

In this question, it is important to state how you apply the pigeonhole principle, and not just to quote it. See the actual solutions for an example of what we expect. Those who missed out steps in their proof derivation got 1-2 points taken off.

Q26) 4 marks

This is a straightforward application of the pigeonhole principle. One just have to realize that there are $10^8 - 1$ different wage levels (in terms of pennies), but 10^8 people. It is important that you state these quantities so that we know you are applying the principle correctly. 1 mark was taken off if the number of wage levels was stated wrongly.

CS 280 Grading Guide – Assignment 6 – Section 4.3

16. (a) 1 point.

(b) 1 point.

(c) 1.5 points. 0.5 points lost for each missing combination term.

(d) 1.5 points. 0.5 points lost for each missing combination term.

18. (a) 1 point.

(b) 2 points. 1 point lost if different arrangements are not taken into account.

(c) 3 points. If you have only considered 1 woman & 9 men case then you lose 1 point. If you considered different arrangements, you lose 1 point.

28. 3 points. If you figured out the unit “011” you get 1 point. Remaining calculations are 2 points.

40. 2 points. If you only have the combination term in the answer, you get only 0.5 points. If your answer is $C(17, 9) \times (3)^9(2)^8$ instead of $C(17, 9) \times (3)^8(2)^9$ you lose 0.5 points. Other powers of 2 or 3 leads to loss of 1 point.

CS 280 Common Mistakes – Assignment 6 – Section 4.3

In general, one of the common mistakes was applying the formula for $P(n,k)$, wrongly.

16. (d) Forgetting to subtract $C(10,0)$ in addition to $C(10,1)$ and $C(10,2)$.

18. (c) Some people came up with the answer :

$$C(3,1) \times C(12,9)$$

Thinking that, "Choose 1 of the women, choose 9 people from the remaining group."

However, this leads to some double and triple counting cases:

e.g. Double count: Let's choose a woman, W_1 . Choose the remaining people as follows:

$W_2 M_1 M_2 M_3 M_4 M_5 M_6 M_7 M_8$.

So we have : $A = (W_1 W_2 M_1 M_2 M_3 M_4 M_5 M_6 M_7 M_8)$ as the selected players.

Another case counted by the above approach can be obtained by choosing W_2 as the first woman, and choosing $W_1 M_1 M_2 M_3 M_4 M_5 M_6 M_7 M_8$ as the remaining players. In this case, the players are $B = (W_2 W_1 M_1 M_2 M_3 M_4 M_5 M_6 M_7 M_8)$. We see that, case A and case B corresponds to the same team, thus this is a double count situation.

Similar examples for triple count situations can also be found.

28. Realizing the question as "each 0 must be followed by exactly two 1s".

40. Forgetting to include $(3)^8(2)^9$ factor in the answer.