

CS 280 – Discrete Structures
HW 4 – Grading Guide

Section 2.4

2.4: Total score = 20

2.4.2(d) – Total 5 points

3 marks for the working
2 marks for the correct answer (139)

–1 if the answer was twice (or any reasonably small multiple) of the correct answer

2.4.14 – Total 5 points

1 mark awarded for each part.
1 additional mark for getting at least 1 question correct

Note: The question specifically stated that the coefficients of each tri-nary digit must be 1, 0 or –1, so regrettably, no marks were awarded for writing the numbers in terms of base 3 format (with digits 0, 1 and 2), even if the sum adds up correctly.

Also, there must be consistency in the format of the solutions; if the first solution is in the format $(3^2, 3^1, 3^0)$, the next solution shouldn't be in reverse format $(3^0, 3^1, 3^2, 3^3)$.

2.4.24 – Total 5 points

1 mark awarded for each part.
1 additional mark for getting at least 1 question correct

Note: The question states that the number must be written in 2's complement format (with 6 bits) so ALL 6 bits should be represented, even if the number is positive, such as “10110;” the correct solution should still be “010110” – the sign bit must be present. No marks were taken off for such a mistake this time, but it is *very important* to avoid making similar mistakes.

2.4.26 – Total 5 points

5 marks given for correct answer
There are different variants of the answer; we will accept it as long as it adequately shows how to obtain $-m$ from m .

Note: Some students thought that it was sufficient to complement all the bits of m . There is one more step; the complemented result must be added to 1. Some students wrote that the rightmost bit of m should be kept constant while flipping all other bits; this is

incorrect as well – the rightmost “1” bit *and all the bits to its right* should be kept constant while *all other bits to the left of this “1” bit should be flipped*.

Section 2.5

2e) 2 points total. Full credit awarded if your answer shows the GCD and the 2 multiplying terms. If one or more of the terms is missing, you received partial credit.

2g) 3 points total. Same comment as above.

10) 5 points total. Most people got full credit on this question. The errors here were in most cases only trivial and lost 1 point.

22) 5 points total. 2 points for getting M_1 while showing working if you used CRT or a good explanation if you didn't. Same for M_2 . 1 point for stating the answer correctly. Many people got 4/5 on this question because there was some problem in their converting their (correct) reasoning to a correct mathematical answer.

36) 5 points total. For the initial conversion of “ATTACK” to its digits, you lost $\frac{1}{2}$ point for getting one of the 3 blocks incorrect. The encryption of each block carried 1 point for a total of 3 points. If you set $A=1$ instead of $A=0$, we kept that in mind while grading your question. In the case of $A=1$, the correct final answer is 0286 0798 0425. Further, in the case that your conversion of “ATTACK” was incorrect, you still received 3.5 points if your final encrypted answer fit your conversion.

Section 2.6

4.(a) 5 points. You lose 1 point for each wrong entry in the resulting matrix.

14. Proof part is 3 points, stating the simple rule is 2 points. If you only use an example to make the proof, you lose 3 points.

20. Totally, (a), (b), (c), (d) parts are 5 points. If you solve any of them incorrectly, you lose 1 point for that part. If all of them are wrong, you get no points.

Extra Problem: 5 points. Finding C is 1 point, finding D is 1 point and finding the result is 3 points.

Common mistakes for HW4-Section 2.6

4.(a)

14. Using a specific example for the proof, not stating the “simple rule” explicitly.

20. Calculating $\det(A) = ad - bc$, incorrectly when using it to find the inverse.