

MAE113 DISCRETE TECHNIQUES FOR COMPUTING

Coursework 3—to be handed in by noon, Wednesday 20/10/2010.

Write your name and student number at the top of your assignment before handing it in. You should attempt all questions because only one question will be marked.

1. (a) Convert 1010101 from binary to decimal.
(b) Convert 313 from decimal to binary.
2. Calculate the following binary numbers (you *must* show your working):
 - (a) $111 + 111011$,
 - (b) $111010 + 1010$,
 - (c) $1010 + 1101 + 1011 + 1111$,
 - (d) $01110 + 10111$ in fixed length 5 (modulo 2^5).
3. Calculate the following binary numbers (you *must* show your working):
 - (a) 11011×101 ,
 - (b) 1101×1010 ,
 - (c) 01111×10101 in fixed length 5 (modulo 2^5).
4. Evaluate by Russian Peasant Multiplication (you *must* show your working):
 - (a) 21×33 ,
 - (b) 141×66 ,
5. Calculate the following binary numbers (you *must* show your working):
 - (a) $100100 - 1011$,
 - (b) $100000 - 11110$,
 - (c) $0110110 - 0011011$ in fixed length 7 (modulo 2^7),
 - (d) $101101 - 110011$ modulo 2^6 .