Print name clearly: _____

PART A: multiple choice (worth 50%)

Put a tick or cross in the box on the left of the correct answer (or answers). Important: In some questions you need to possibly mark more than one box in a given question to get full marks for that question. Incorrect answers are penalised.

Q. 1 *The number* 233_{10} *is equal to the following:*

☐ 10101001_2 ☐ 11001001_2 ☐ 11111001_2 ☐ 11101001_2

Q. 2 *The number* 233_8 *is equal to the following:*

☐ 150_{10} ☐ 164_{10} ☐ 155_{10} ☐ 159_{10}

Q. 3 *What is the* magnetude *of the 10-bit two's complement number* 1011100010_2 *:*

☐ 286_{10} ☐ -739_{10} ☐ 738_{10} ☐ -286_{10}

Q. 4 *What is the* 10*'s complement of* 4 *:*

☐ *9's complement*+1 ☐ 5 ☐ -6 ☐ 6

Q. 5 *What representation scheme(s) let(s) me perform a 10's complement operation on binary representations of decimal digits, through performing the one's complement operation on the binary directly:*

☐ *4221-code*
☐ *the* 2*'s complement number system*
☐ *XS-3 code*
☐ *grey code*

Q. 6 *Express the unsigned fixed point binary* 0011110010_2 *as a decimal, assuming the format* $bbbbb.bbbbb_2$ *:*

☐ 7.06250 ☐ 6.56250 ☐ -7.56250 ☐ 7.56250

Q. 7 *ABBA may represent :*

☐ *a number in base* 16
☐ *a number in base* 10
☐ *a number in base* 14
☐ *a 70's pop group*

Q. 8 *The Hexadecimal number* 67565_{16} *has a value :*

☐ $= 1472545_8$ ☐ $< 67565_{10}$ ☐ $< F0000_{16}$ ☐ $< 1000000_{10}$

Q. 9 *The sum* $110101_2 + 101_2$ *is equivalent to:*

☐ *none of the others* ☐ 111010_{10} ☐ $= 65_8 + 5_8$ ☐ 00111010_2

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Q. 10 *The binary product* $110101_2 \times 101_2$ *is equivalent to:*

- ☐ *none of the others*
- ☐ $110101_2 + 11010100_2$
- ☐ $110101_2 + 1101010_2$
- ☐ $5_{10} \times 65_8$

Q. 11 *Appendix A gives a table for 7-bit ASCII. Using this table, give the hexadecimal value corresponding to the encoding of the ascii string "ABBA" (Assume each 7-bit code occupies the space of an 8-bit byte with the MSB=0):*

- ☐ 61626261_{16}
- ☐ 65666665_{16}
- ☐ 41424241_{16}
- ☐ $1011021021 01_{16}$

Q. 12 *What decimal value has to be added to the ASCII for the upper case letter "F" to obtain the ASCII for the lower case letter "f" (see Appendix A):*

☐ $2^5 - 1$ ☐ $102 - 70$ ☐ $66 - 46$ ☐ $146 - 106$

Q. 13 *From Appendix A, the binary ASCII code for the letter "G" is:*

☐ 1000111 ☐ 0111×100 ☐ $0111 + 100$ ☐ 0111100

Q. 14 *The first 32 characters of ASCII are control characters. For example, CR (Carriage Return) character is often used at the end of a line of text in a file. What key or combination of keys on the computer keyboard will generate the "CR" character*

- ☐ *ctrl-M (i.e. "ctrl" key simultaneously with the "M" key)*
- ☐ *shift-M (i.e. "shift" key simultaneously with the "M" key)*
- ☐ *ctrl-H (i.e. "ctrl" key simultaneously with the "H")*
- ☐ *"enter" key*

Q. 15 *The binary number* 11010.110001 *is equivalent to:*

- ☐ 1.110110001×2^6
- ☐ 1.110110001×2^4
- ☐ 0.11010110001×2^5
- ☐ 1.110110001×2^5