

MATHEMATICS FOR CS, A15, TEST 1

Name: -----

Student number-----

(1) (1.5 mark) a) Convert the decimal number $(393.78)_{10}$ to base 5.

b) Convert the base 8 number $(3036.52)_8$ to a decimal fraction.

(2) (2.5 mark) a) Convert to binary $(231.875)_{10}$

b) Perform the addition $(1010001.101)_2 + (10111011.11)_2$ in binary.

c) Perform the multiplication $(1101.11)_2 \cdot (110.1)_2$ in binary.

(3) (2.5 marks) a) Perform the subtraction $(110011.101)_2 - (111101.1)_2$ in binary.

b) Perform the subtraction $(10011100)_2 - (1100101)_2$ via addition with two's complement.

c) Perform the division $(10011001.11)_2 \div (11001.101)_2$ in binary.

(4) (2.5 marks) a) Convert to octal: $(A1B.C)_{16}$.

b) Convert to hexadecimal: $(607.35)_8$.

c) Convert to binary, octal and hexadecimal: $(137)_{10}$.

(5) (3 marks) a) Perform the subtraction $(207.33)_8 - (146.65)_8$ in octal.

b) Perform the subtraction $(55214)_8 - (27501)_8$ via addition with 8's complement.

c) Perform the multiplication $(534.6)_8 \cdot (45.2)_8$ in octal.

(6) (3 marks) a) Perform the addition $(ADD.C0D)_{16} + (DEAD.F44)_{16}$ in hexadecimal.

b) Perform the subtraction $(E3C.20C)_{16} - (629.A2D)_{16}$ in hexadecimal.

c) Perform the multiplication $(E23.4)_{16} \cdot (AB)_{16}$ in hexadecimal.