國立雲林科技大學 113 學年度 碩士班招生考試試題

系所：資工系

科目：計算機概論(1)

1. (15 points) A computer system has 20 address lines and 32-Kbyte cache. Each cache block size is 128-byte. For the following cases, how many tag-bit is required for each cache block?
   (a) A direct mapped cache
   (b) A fully associative cache
   (c) A 8-way set associative cache

2. (10 points) Find E[X] and Var[X] when the density function of X is $f(x) = \begin{cases} 2x, & \text{if } 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$

3. (10 points) If a die is rolled 4 times, what is the probability that 6 comes up at least one?

4. (10 points) What constitutes the OSI 7-layer model? Among these layers, which ones operate in a point-to-point capacity, and which ones operate in an end-to-end capacity?

5. (5 points) For a big-endian CPU, if we store the value 0x12345678H at memory address 0x1000, what will be the value at memory address 0x1002?

6. (15 points) Convert the decimal number $(47802.6875)_{10}$ to binary, octal, and hexadecimal.

7. (15 points) Please provide the hexadecimal representation for the decimal number 63.25, formatted according to the IEEE-754 single precision standard.

8. (10 points) Please briefly describe the concept of "forwarding (by passing)" for a RISC processor.

9. (10 points) Please derive the simplest SOP (Sum of Products) expression for the following Boolean function.

$$f(w,x,y,z) = w'xy' + w'y'z + wxy'z' + xyz'$$