

八十六學年度 工業工程 系(所) 工程管理 組碩士班研究生入學考試

科目 計算機概論 科號 3702 共 2 頁第 1 頁 *請在試卷【答案卷】內作答

1. Figure 1 shows a simplified logic diagram of a vending machine. One problem with this design is that after putting money input, if the buyer press C and T, both coffee and tea will be served with only single money input. (15%)

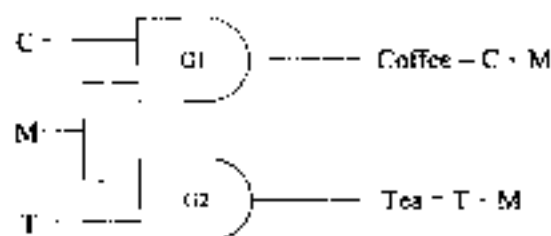


Figure 1

- (a) Add circuit to the diagram so that the above mentioned problem can be avoided. Provide truth table and Boolean expression for coffee and tea. (Note. if both coffee and tea are ordered, only coffee will be served.)
- (b) Now that there is a shortage of AND gates. Implement the functionality of (a) without using any AND gate. Provide a Boolean expression for coffee and tea based on your circuit.
2. Explain and compare the following data structures. (10%)
- Array
 - Queue
 - Stack
 - Linked list
 - Doubly linked list
3. Convert the following numbers according to the requirements: (8%)
- $1101\ 1010\ 1001$ (BCD) to Hexadecimal number
 - $(291)_H$ (hexadecimal) to BCD
 - 275_{10} (10-based) to BCD
 - 123_8 (8-based) to Hexadecimal code.
4. Explain what the following acronyms stand for: (12%)
- | | |
|--------|--------|
| RAM | BIOS |
| ROM | SCSI |
| PCMCIA | CD-ROM |

八十八學年度 工業工程 系(所) 工程管理組碩士班研究生入學考試

科目 計算機概論 科號 3702 共 2 頁第 2 頁 *請在試卷【答案卷】內作答

5. Diagram major components of a typical personal computer system including commonly used input and output devices. Explain the function of each major component. (10%)
6. A(100) is an array of 32-bit real number and the computer is a 16-bit machine. If the address of A(10) is at 00F0_H. What is the address of A(100)? (8%)
7. (a) Explain and compare "while" statement and "do-while" statement in C programming language. (5%)
 (b) Explain and compare "for" statement and "while" statement in C programming language. (5%)
8. Assuming that `intarr[]` is an one-dimensional array containing integer elements. Which of the following statement represents the stored value of the third element of the array? (5%)
- (a) `*(intarr + 2)`
 (b) `*(intarr + 4)`
 (c) `intarr + 4`
 (d) `intarr + 2`
9. What is the output of the following C program? (10%)
- ```
main()
{
 int i = 20;
 *j = &i;
 i = *j + 3*i;
 *j = i*2;
 printf("%d\n", i + *j);
}
```
10. Write an algorithm to locate first 1000 prime numbers and store them in the array P(1000). Draw the flow chart for your algorithm. (12%)