King Mongkut's University of Technology Thonburi

Final Exam of Second Semester, Academic Year 2015

CPE 100 Computer Programming for Engineers   Environmental Engineering 1st year.

Friday 27 November 2015   13.00-16.00

Instructions

1. This examination contains 28 problems, 10 pages (including this cover page).

2. The answers must be written in this exam paper. Please read the instructions carefully.

3. Vague answer will get fewer score than short and precise answer.

4. Calculator is not allowed.

5. Dictionary is not allowed

6. No books, notes, or any other documents can be taken into the examination room.

7. Good luck and have fun with the exam

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Part 1: Write a short answer for the following questions (2 pts. Each)

1. What do you use to generate machine codes from C source codes?

2. What are the C primitive data types?

3. How many bytes are there in a **char** datatype?

4. What is the largest number **unsigned short int** can keep?

5. What are the datatypes you can use with **switch case**?

6. What does **||** operator do in this **a = a || b** statement?

7. What does **^** operator do in this **a = b^c** statement?

8. What is the primitive type of **1.2f**?

9. If **a=9** and **b=5,** what is the result of **!(((a>5) && (b<10)) ||(a< b))** ?

10. What is the difference of a **do while** loop from the other two?

11. What kind of data is actually store in a file?

12. What header file do you have to include when you use **rand** and **srand** functions?

13. What function can you use when you want to find out a length of a string?

14. What is the symbol that is used for string termination?

15. What is the value that is return from **strcmp("a","a")**?

16. Describe what does this statement do **if(!(fp=fopen("a.txt","r"))) return -1;?**

17. What is the difference between int main() and void main()?

18. How can you declare a string called **name** that is not longer than 100 characters?

Part 2: Write the output of the following pieces of C codes (3pts. Each)

19. What is the output of the code in the following box?

```
int x,y,i;
i=6;
while(i)
{
        x=i--; y=--i;
        printf("%d,%d\n",x,y);


}
```

20. What is the output of the code in the following box?

```
int n;
n=10;
n%=3;
printf("n=%d\n",n);
```

21. What is the output of the code in the following box when input is 3 4?

```
int x,y;
scanf("%d %d",&x,&y);
if(x>y){
        printf("x>y");
}else{
        if(x%y==0){
                printf("mod(%d,%d) = 0\n",x,y);
        }else{
                printf("%d / %d = %.2f\n",x,y,(float)x/y);
        }
}
```

22. What is the output of the code in the following box when input is **B**?

```
char c;
scanf("%c",&c);
switch(c-'A')
{
        case 0: printf("hello");
        case 1: printf("world");
        case 2: printf("!!!");
}
```

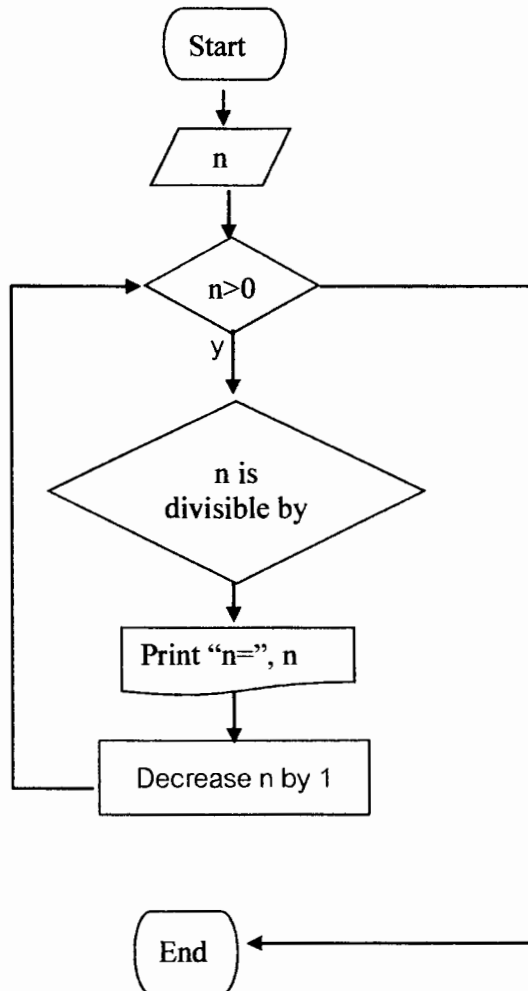23. What is wrong with the code in the following box? Propose a correct version below.

```
int x,y;
scanf("%d %d",x, y);
for(c = x; c<=y; c++);
        printf("%d\n",c);
```

Part 3: Write a flowchart, program, or function

24. Write a flowchart that describes a program that takes two integer n and m. Then show only the even number from n to m on the screen. (10 pts)

25. Write C code associated with this flowchart (10 pts)

26. Write a C function that take an integer n as a parameter then calculate the value of the summation from 1 to n and return as a long int. (10 pts)

27. Write a program that take three inputs (a,b, and c) from user. Then write and use swap function to arrange the smallest value to variable a, the middle value in variable b, and largest value in variable c. (10 Pts)

28. Write a program that take a filename from user. Then the program will open the file and count numbers of each alphabet and show the result from 'A' to 'Z'. The small letter and capital letter are count together. For example. "Aa" has 2 A's. (10)