ICS 103, Term 083

Computer Programming in C
Quiz# 4

Date: Tuesday, August 25, 2009

Find the output of each of the following programs:

Program	Output

(i)   5 points
 	
``c
#include <stdio.h>
 	
int test(int a[], int t, int n)
{
  int i=0, j=-1, k=0;
 	
  while (!k && i < n) {
    if (a[i] == t)k = 1;
    else i++;
  }
  if (k) j=i;
 	
  return j;
}
 	
int main(void)
{
  int x[]={10, 5, 15, 20, 1};
 	
  printf("%d\n", test(x,15,5));
 	
  return 0;
}
``
	2
	
	The function test is a linear search function and it is called to search for number 15 in array x and it returns its index which is 2.

(ii)   **5 points**

```c
#include <stdio.h>

int main(void)
{
  int x[]={10, 5, 15, 20, 1};
  int i, j, k, l;

  for (i=0; i<4; i++) {
      k=i;
      for (j=i+1; j<5; j++)
        if (x[j] < x[k])
          k = j;
      l=x[i]; x[i]=x[k]; x[k]=l;
  }

  for (i=0; i<5; i++)
      printf("%d ", x[i]);

  return 0;
}
```

1 5 10 15 20

The program sorts the array x in ascending order using selection sort algorithm and prints the sorted array.

(iii) 5 points	

``c
#include <stdio.h>
#include <string.h>
 	
int main(void)
{
  int i;
  char x[]="ICS";
 	
  for (i=0; i<strlen(x); i++)
      puts(&x[i]);
 	
  return 0;
}
``
	ICS
	CS
	S
	
	The program prints the string x 3 times, the first time starting from the first character, the second time starting from the second character and the third time starting from the third character.

(iv) 5 points	

``c
#include <stdio.h>
#include <string.h>
 	
int main(void)
{
  int i;
  char x[5]={0}, y[]="A";
 	
  for (i=0; i<4; i++){
      strcat(x,y);
      y[0]++;
      puts(x);
  }
 	
  return 0;
}
``
	A
	AB
	ABC
	ABCD
	
	The program concatenates string x and y in each iteration and then prints the concatenated string x and increments the character stored in the string y.
	In the first iteration, x has no characters and y="A". Thus, the concatenated string x="A".
	In the second iteration, x ="A" and y="B". Thus, the concatenated string x="AB".
	In the third iteration, x ="AB" and y="C". Thus, the concatenated string x="ABC".
	In the fourth iteration, x ="ABC" and y="D". Thus, the concatenated string x="ABCD".