COMPUTER SCIENCE- 2003

Paper-2

(PRACTICAL)

(Planning Session : Two hours)

(Examination Session: one hour)

(Maximum Marks: 100)

INSTRUCTIONS

As it is a practical examination, the candidate is expected to do the following:

(a) Write an algorithm for the selected problem.

(b) Prepare an Input/Process/Output table indicating the required inputs for the problem. Also state the method/formula for solving the problem and mention the required output.

(c) Write a program in C++, test run the program on the computer using the given test data and get a print out (hard copy) in the format specified in the problem alongwith the program listing.

Solve any **one** *of the following problems*

Q1. A simple encryption system uses a shifting process to hide a message. The value of the shift can be in the range 1 to 26. For example a shift of 7 means that A = U, B =V,C = W, etc.i e.

Text : A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Code: U V W X Y Z A B C D E F G H I J K L M N O P Q R S T

Fist an extra space is added to the end of the string. To make things little more difficult, spaces within the original text are replaced with QQ before the text is encrypted. Double Q (QQ) was selected because no English word ends in Q or contains QQ.

Additionally the coded message is printed in blocks of six characters separated by spaces. The last block might not contain six characters. Write a program that takes the coded text (less than 100 characters), the shift value and prints the decoded original text.Your program must reject any non-valid value for shift and display an error message "INVALID SHIFT VALUE)".Assume all characters are upper case. Test your program for the following data and some data that you have coded, using the rules given above:

SAMLE DATA:

INPUT:
CODED TEXT : "UHINBY LKKQCH HYLKK"
SHIFT : 7
OUTPUT:
DECODED TEXT : ANOTHER VALUE

INPUT:
CODED TEXT : "RUIJGG EVGGBK SAGG"
SHIFT : 11
OUTPUT:
DECODED TEST : BEST OF LUCK

INPUT:
CODED TEXT : "DKSMMW NAMMUK QMM"
SHIFT : 29
OUTPUT:
INVALID SHIFT VAULE

Q2. Give a time in numbers we can convert it into words. For example :

5 : 00	five o'clock
5 : 10	ten minutes past five
5 : 15	quarter past five
5 : 30	half past five
5 : 40	twenty minutes to six

5 : 45	quarter to six
5 : 47	thirteen minutes to six

Write a program which first inputs two integers, the first between 1 and 12 (both inclusive) and second between 0 and 59 (both inclusive) and then prints out the time they represent, in words. Your program should follow the format of the examples above.

SAMPLE DATA :

INPUT :		
TIME :	3,0	
OUTPUT :	3 : 00	three o' clock
INPUT :		
TIME :	7,29	
OUTPUT :	7 : 29	twenty nine minutes past seven
INPUT :		
TIME :	6,34	
OUTPUT :	6 : 34	twenty six minutes to seven
INPUT :		
TIME :	12,1	
OUTPUT :	12 : 01	one minute past seven
INPUT :		
TIME :	12,45	
OUTPUT :	12 : 45	quarter to twelve
INPUT :		
TIME :	10,59	
OUTPUT :	10 : 59	one minute to eleven
INPUT :		
TIME :	14,60	
OUTPUT :	incorrect input	

Q3. Write a program to declare a square matrix A [ ] [ ]of order N (N < 20). Allow the user to input positive integers in to this matrix. Perform the following task on the matrix:

(i) Output the original matrix.

(ii) Fins the SADDLE POINT for the matrix such that is the minimum element for the row to which it belongs and the maximum element for the column to which it belongs. Sadle point for a given matrix is always unique. If the matrix has no saddle point, output the message " NO SADDLE POINT ".

Test your program for the following data and some random data :

SAMPLE DATA :
INPUT : N = 4
MATRIX A [ ] [ ] =

2	5	6	9
8	4	12	3
6	7	3	1
12	24	2	11

OUTPUT :

2	5	6	9
8	4	12	3
6	7	3	1
12	24	2	11

NO SADDLE POINT

MATRIX AFTER SORTING THE PRINCIPAL DIAGONAL

2	5	6	9
8	4	12	3
6	7	3	1
12	24	2	11

INPUT : N = 3
MATRIX A [ ] [ ] =

4	16	12
2	6	14
1	3	8

OUTPUT :

```
4    16    12
2    6     14
1    3     8
```

SADDLE POINT = 4

MATRIX AFTER SORTING THE PRINCIPAL DIAGONAL

```
4    16    12
2    6     14
1    3     8
```