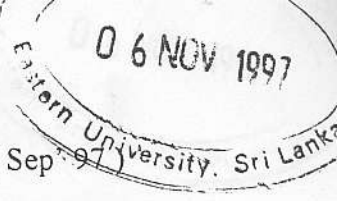


EASTERN UNIVERSITY, SRILANKA

Second Examination in Science - 94/95 & 95/96 (Sep 97)



MT 206 - Pascal Programming

Answer **four** questions only

Time: 2 hours

NOTE :: For the programming problems, marks will be awarded for the structure of the code, its readability, use of suitable comments, choice of meaningful names for the identifiers, and its correctness.

Q1.

Briefly describe the *Standard Primitive Data Types* in Pascal. (20)

Write down the *Input Statements* in Pascal and explain their key differences. (10)

Write a program to read a time duration in seconds and then to display this Duration in number of days, hours, minutes and seconds.

e.g. input : duration (in seconds) : 455723

output : 5 days 6 hours 35 mins 23 sec (30)

Write a program to read a positive integer Y and a real number X, and to display the X to the power of Y (X^Y). (40)

Q2.

A company pays its security guards in hourly basis. The rate of payment is 60 Rs/hour between 6.00 A.M to 6.00 P.M and 120 Rs/hour in the rest of the day. (10)

Write a program to calculate the total payment for a guard for a day. This program should read the values for *starting time* and the *end time* in 24-hours format. Entries are confined to one day. If a guard works continuously into the next day, two separate entries are made for each day. This program should also detect and report any error in input values.

(100)

guards

Q4.

Consider the following Pascal program.



```
CONST
```

```
    Space = ' ';
```

```
VAR
```

```
    X, D, LD : integer;
```

```
Begin
```

```
    Readln( X );
```

```
    If X < 2 Then Exit;
```

```
    D:=2;
```

```
    LD:=1;
```

```
    Repeat
```

```
        If X mod D = 0
```

```
        Then If LD < D
```

```
            then begin
```

```
                Write(D, Space);
```

```
                X := X div D;
```

```
                LD := D;
```

```
            End
```

```
        Else
```

```
            X:= X div D
```

```
        Else
```

```
            D := D +1
```

```
    Until X=1;
```

```
End.
```

What does the above program do ?

(40)

What would be the output of the program for the following values for X ?

X = 45, X = 2, X = 1.

(30)

Is the above program user friendly? Explain your answer.

(10)

Is it possible to replace the above nested If-Then-Else statement by a Case-End statement? Explain your answer.

(10)

Is it possible to replace the above Repeat- Until statement by a For- Do statement? Explain your answer.

(10)

Q4.

Briefly explain the ARRAY data type in Pascal. (15)

Write a program to read a paragraph terminated by the special character '#', and to count the number of occurrences of each characters 'A' to 'Z' and to display the number of occurrences and the percentage of occurrences against each of these characters. Here all the *lower case* letters should be counted as *upper case*.

Example Output :

Letters	Count	Percentage
A	24	3
B	12	1.5

And so on

(85)

Q5.

The following declarations are made in a Pascal program to keep records of the residents of a hostel. There are 200 rooms in the hostel and maximum three students can be accommodated in each room. Rooms are numbered from 1 to 200.

Const

MaxRoom = 200;

MaxInRoom=3;

Type

RegisterNoType = string[10];

RoomType = Record

Students : Array[1..MaxInRoom] of RegisterNoType;

NoOfStudents : 1..MaxInRoom;

End;

HostelType = Array[1..MaxRoom] of RoomType;

VAR

Hostel : HostelType;

Assume that the array variable **Hostel** has all the relevant information. That is the field variable '*Hostel[I].Students[J]*' will give the Registration Number of the J th student in the Room Number I. Similarly the field variable '*Hostel[I].NoOfStudents*' will hold the number of students in the room I.

Write a procedure which accepts the variable **Hostel** as its actual parameter and to display the room numbers against the number of vacancies (if any)

(100)

Q6.

(a)

Compare the RESET and REWRITE commands in the context of TEXT files.

(10)

A company keeps information regarding the prices of the steel bars it sells in a text file named 'price.txt'. Steel bars are of different sizes and are numbered from 1 to 200. Each line in this text file contains two values; size number of a steel bar and the corresponding price.

Write a function which uses the above text file 'price.txt' to calculate the cost of a single sale. This function should accept size of the bar and the quantity sold as its parameters and should return the total cost of this sale.

(40)

(b)

What does it mean by a Dynamic Data Structure?

(10)

Briefly explain each of the following Pascal statements using suitable illustrations.

VAR

A, B : ^char;

Begin

New(A); A^ := '5';

B := A; Write(A^, B^);

B ^ := '4'; Write(A^, B^);

New(B); B^ := '7'; Write(A^, B^);

A^ := B^; Write(A^, B^);

A := B; dispose(B);

End.

(40)