E 386-4

Candidate's Seat No. :

GUJARAT UNIVERSITY
M. Sc. (Electronic Science) Semester-II Examination

ELE-408: Microprocessor-II and Programming in C Language-I
(New syllabus)

Date :   **Time: 3 Hrs**

Instructions:
1. Maximum Marks 70
2. Attempt all questions.
3. Symbols carry their usual meanings.
4. Scientific calculators are allowed

Q 1a) List the difference between serial and parallel data transfers. Discuss Asynchronous and synchronous data transfer format with relevant schematics. [07]

OR

Q 1a) Draw a block diagram of typical Modem devices. Discuss three basic modulation techniques with relevant schematics. [07]

Q 1b) List four basic features of PIC 8259. Draw the pin diagram and the block diagram of PIC 8259. Also discuss each block briefly. [07]

OR

Q 1b) List the difference between 8253 and 8254 programmable interval timers. Write two features of programmable interval timer. Draw a pin diagram and a functional bock diagram of 8253. [07]

Q 2a) Draw neat sketch and suitable interface connection of a microprocessor based scheme to measure, display and control level of a water tank. Write relevant program. [07]

OR

Q 2a) Draw a schematic diagram and show interface connections for a microprocessor based scheme for controlling a stepper motor. Write a main program and a subroutine for controlling stepper motor. [07]

Q 2b) Give brief introduction of INTEL - 8086 microprocessor. Draw a block diagram of INTEL - 8086 and discuss functional units of INTEL - 8086. [07]

OR

Q 2b) Draw a schematic of register organization of INTEL - 8086. List various registers of it and discuss each one. [07]

Q 3ai). With help of examples discuss basic data types used in C language. What is a qualifier (modifier), mention the qualifiers that can be used with integer data [03]

3aii). If a, b and c are sides of a triangle, area of the triangle is given by the formula

$$A = \sqrt{S(S-a)(S-b)(S-c)}$$

Where 2S=a+b+c. Write a program to read the three sides of a triangle, calculate the area and print all three sides and area. The program also should print the value of the longest side. **[04]**

OR

Q 3a). With help of a block diagram explain *for* loop.

Write a program to read value of x, evaluate e^x using the following series with user specified accuracy. Program also should print how many terms are to be used to get the specific accuracy. **[07]**

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots\ldots\ldots$$

Q 3bi) Write *for* statements to print following sequence of integers **[03]**
  (i) 2 6 10 14 18 22
  (ii) -6 -4 -2 0 2 4 6 8
  (iii) 1 8 27 64 125

3bii). Write down the output of the following program segment **[04]**

```
for (i = 1;  i < 5;  i++)
{      for (j = 1;  j <= i;  j++)
  {      if( (i+j) % 2 == 0)
        printf("1\t");
      else
        printf("0\t");
  }      printf("\n");
}
```

OR

Q 3b). With help of block diagrams distinguish between *while* loop and *do while* loop.

Write a program to read a number, obtain the binary number corresponding it and print both numbers. **[07]**

Q 4ai). What is a string? With help of examples mention two methods of initializing strings. With examples discuss two methods of reading strings through keyboard. **[03]**

4aii). Write a program to read two strings and append (attach) the second string on the first string (without using strcat()) then print both strings. **[04]**

OR

Q 4a). Write a program to read a series of 100 values and calculate standard deviation of the series using the following formula

$$s = \frac{1}{n}\sum_{i=1}^{n}(x_i - m)^2 \quad \text{where } m \text{ is the mean of the series.}$$

The program should print mean and standard deviation of the series. **[07]**

Q 4bi). Write a program to read a string and a character, then check how many times the character is repeated in the string. **[03]**

4bii). Write a program to read 10 x 10 matrix, find out and print sum of both diagonals separately. **[04]**

OR

Q 4b). Write a program to read 50 values, and then arrange them in descending order. The program should print the original series and the sorted series. **[07]**

Q 5). Answer the following questions (each of one mark) **[14]**

i). List various addressing modes of INTEL - 8086

ii). What is 'ICW'?

iii). "8253/8254 is compatible with 8085". True or false?

iv). If serial transmission rate is 110 Band. Calculate time for one bit.

v). _____ data transfer is used for high speed (Synchronous/Asynchronous)

vi). What do you understand by communication?

vii). Explain instruction MOV CX, [0310] of INTEL - 8086.

viii). The escape sequence character _____ causes the cursor to move to the next line on the screen.

ix). Find errors if any in the following program segment
```
include math.h
{       print("%d", &x)      }
```

x). Pick up C language keywords from the following
default, switch, string, main, brace, colon

xi). Which of the following are invalid variable names? Why?
First.name, doubles, 3rd-row, Mass, column_2

xii). Write C statements to perform the following

$$x1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

xiii). Write output of the following program segment
```
int x=2, y=3, z=4;
printf("%d %d %d %d", z/y*x, (1/y)*z*x, z/(y*z), x/y*z);
printf("%d %d %d &d", sizeof(z), sizeof(double), sizeof(8.8), (int)(z/3.0)),
```

xiv). Write down the output of the following program statement
```
printf("%6.2f %10.1e", 987.6543, 987.6542);
```

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