*C programming*

*Jan – March 2022*

*Group Practical Assignment*

***Compulsory to all students (submit Soft copies). Use either C or Visual basic where appropriate***

**Qn 1.** Write a program which captures the values of a, b, and c from the keyboard and computes the value of sum and average.

**Qn 2.** Write a program which captures the values of a, b, and c from the keyboard and computes the value of x; where x= (-b +√ (b2-4ac))/2a.

**Qn 3**. Write a program which captures the values of a, b, and c from the keyboard and outputs the maximum or minimum. Hence write an algorithm and draw a flow chart.

**Qn 4.** using visual basic write a program which captures three strings from the keyboard store them in a, b, and c; output them as a single string.

**Qn 5.** Write a program code using c/vb language, which computes and prints the sum of squares of numbers from 11 to 3.

**Qn 6.** Write a method using c/vb language which computes and returns the cube of odd numbers from 1 to 100. Hence write an algorithm and draw a flow chart.

**Qn 7.** Write a program using c/vb compiler which captures the following from keyboard and prints them on the screen.

1. Your surname and other names
2. Your registration number
3. The year of study
4. Your current university
5. concatenates the strings above and output them as one string in the form: Am\_\_\_\_\_\_Reg no\_\_\_\_\_\_\_in\_\_\_\_\_\_\_at\_\_\_\_\_\_\_\_\_

**Qn 8.** Write a program which captures two integers from keyboard, computes and prints the following:

1. The product
2. The average
3. The maximum value
4. The minimum value
5. The absolute value between the two integers.

**Qn 9.** Write a program which computes and prints prime numbers from 1 to 100

**Qn 10.** Write a program which computes and prints SUM of cubes of odd numbers from 0 to 100. Hence write an algorithm and draw a flow chart.

**Qn 11.** Write a program which computes and prints SUM of squares of even numbers from 1 to 99. Hence write an algorithm and draw a flow chart.

**Qn 12.** Write a program which computes and prints SUM of squares of even numbers from 0 to 100. Hence write an algorithm and draw a flow chart.

**Qn 13.** Write a program which computes and prints SUM of cubes of odd numbers from 1 to 101. Hence write an algorithm and draw a flow chart.

Qn 14.Write down a program which computes and prints the following integers.

1, 8, 27, 64, 125, 256. (5 marks)

b) Write a program which computes and prints the sum of squares of integers which are divisible by 3 and 5 from 100 to 1. (5 marks)

15). Write a program which computes the grades of students in colleges and Universities. Basing on the following conditions and assume the initial mark=60. (6 marks)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Marks** | 80-100 | 75-79 | 70-74 | 65-69 | 60-64 | 55-59 | 50-54 | 0-49 |
| **Alpha Grade** | A | B+ | B | C+ | C | D+ | D | F |
| **Grade Point** | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 | 2.5 | 2.0 | 0 |

16) Explain the meaning/role of each of the statements in the section of code that follows. (8 marks)

1. #include<stdio.h>
2. int main()
3. {
4. int a,b;
5. scanf("%d",&a);
6. scanf("%d",&b);
7. if (a > 0 && b > 0)
8. printf("Both numbers are positive\n");
9. if (a == 0 || b == 0)
10. printf("At least one of the numbers = 0\n");
11. if (!(a > 0) && !(b > 0))
12. printf("Both numbers are negative\n");
13. return 0;
14. }

17) Design a program that takes as **input from the user** three values representing the sizes for the three sides of a box. Your program should be able to calculate the base Area and the volume of the box and print the results to the visual display unit (Screen). (6 marks)

18) State the output of the program below. (6 marks)

1. #include <stdio.h>
2. int main()
3. {
4. int i, j;
5. printf("start of program\n");
6. for(i = 0; i < 3; i = i + 1)
7. {
8. printf("i is %d\n", i);
9. for(j = 0; j < 5; j = j + 1)
10. printf("i is %d, j is %d\n", i, j);
11. printf("end of i = %d loop\n", i);
12. }
13. printf("end of program\n");
14. return 0; }

**SET 1**

**SCS 1202 PROGRAMMING LANGUAGE FUNDERMENTALS**

**Question 1**

a) Write a program which captures four numbers with decimal points from keyboard computes and prints the following.

1. The maximum number.(4 marks)
2. The average.( 2marks)
3. (4 marks)

Where a, b, c, d are numbers captured from keyboard.

b) Object oriented programming emphasis Bottom up programming paradigm approach that leads to developing a new program from existing one targeting software reuse.

1. Define the terms: Bottom up and Top down programming(4 marks)
2. Evaluate the benefits and limitations of software reuse in programming. (6 marks)

**Question 2**

1. With the aid of appropriate examples distinguish between the following terms as used in C programming.(2 marks @)
   1. Variable and constants
   2. Syntax errors and Semantic errors

b) Write a program which computer and prints the sum of cubes of integers which are divisible 2, 3 and 5 from 1 to 100. (5 marks)

c) Write a program which compute and prints the factorial of an integer 6. (5 marks)

d) Write a program which computes and prints the squares of even integers from 101 to 1, without altering the question. (4 marks)

**Question 3**

C programing language uses switch statement whereas visual basic programming uses select case statement in decision making.

a) State the syntax and semantics of the following:

1. Switch statement. (5 marks)
2. Select case statement. (5 marks)

b) Explain the difference between switch statement and select case statement. (4 marks)

c) Develop a university grading system which the department of computer science can use to carry out grading of students marks using select case. (6 marks)

|  |  |  |
| --- | --- | --- |
| Marks | Grade | Comment |
| 80-100 | “A” | 5.0 |
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| 60-69 | “C” | 3.0 |
| 50-59 | “D” | 2.0 |
| 0-49 | “F” | 0.0 |

**Question 4**

1. Define the terms: infinity loop, flow chart, mnemonics and pseudocode as used in programming.(4 marks)
2. State the output of the program below. (6 marks)
3. #include <stdio.h>
4. int main () {
5. int i, j;
6. for(i = 2; i<50; i++) {
7. for(j = 2; j <= (i/j); j++)
8. if(!(i%j)) break;
9. if(j > (i/j)) printf("%d is prime", i);
10. }
11. return 0;
12. }
13. Write a pseudocode for the above program. (5 marks)
14. Represent the program above on a flow chart.(5 marks)

**Question 5**

The interface below was created using visual basic. Assume the boxes represent textbox1 up to textbox10.

**LEBELS TEXT BOXES**

NUMBER a

Number b

Number c

NUMBER d

Root X1

Sum

Average

MAXIMUM

**Required to;**

a) Write a program to capture the values using visual basic and then computes and prints the following; (3 marks @)

1. The sum
2. The average
3. The root X1
4. The Maximum of a, b, c and d

b) Solving a problem on a computer involves a number of activities and steps, clearly show and explain the steps we follow in problem solving and software development in programming. (8 marks)

**Question 6**

1. Write down the syntax of a ***while loop*** and explain how it works.(5 marks)
2. Write down a program which computes and prints the following integers.

1, 8, 27, 64, 125, 256. (5 marks)

c) Write a program which computes and prints the sum of squares of integers which are divisible by 3 and 5 from 100 to 1. (5 marks)

d) With the aid of appropriate examples distinguish between structured and even driven programming. (5 marks)

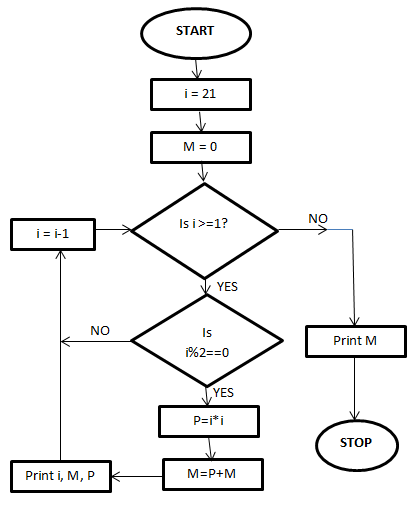
**Question 7**

a) Identify which of the following are valid identifies. (3 marks)

1. Ralph25
2. 90shillings
3. mission\_control
4. E%
5. A$
6. \_off

b) Give a clear distinction between variable declaration and variable initialization by giving relevant examples. (3 marks)

c) From the flow chart below,



1. Perform a dry run for the flow chart given above. (5marks)
2. State the values of **i, M** and **P** after executing the above algorithm. (2marks)
3. What is the relationship between **P and I**? (2marks)

d) Represent the algorithm on a flow chart into a running program using a do while loop

(5 marks)

**SET 2**

**Question 1**

1. Write down the syntax of **do…while** loop. (2 marks)
2. Given a series *1+8+27+64+125+…. + 1000;* we can compute its sum in several ways.

Design an algorithm using

1. C programming language that prints the sum of the above series (6 marks)
2. Flow chart that computes and prints the sum of the above series. **(6 Marks)**
3. Write down a pseudo code that represents the above algorithm. (6**Marks)**

**Question 2**

1. Write down the syntax of a ***while loop*** and explain how it works.(5 marks)
2. Using the concept of nested loops of your choice, write down a Java program that will print the following pattern on the screen. (7 marks)

\*

* + \*
  + \* \*
  + \* \* \*
  + \* \* \*
  + \* \*
  + \*

**c)**  KYU is in need of a system to register students bio-data. The system is supposed to capture the RegistrationNumber (text/string), Course (text) and age (whole number). When the system starts running, the user is required to enter the above details and it prints them on the screen. Then the user is requested to enter 1 to continue or any other integer to stop. Write down a C- PROGRAMMING program that solves this problem. (8 marks)

**Question 3.**

1. With the aid of appropriate examples distinguish between the following terms as used in C programming.(4 marks @)
   1. Variable and constants
   2. Syntax errors and Semantic errors
2. Use the code below and an array M to answer the questions that follows.

int [ ] M= {9, 8, 7, 6, 5};

*// outer loop captures the number passes*

for (i = 0; i < 5; ++i) {

*// captures the comparisons for each pass*

for(j = 0; j < 4;++j)

if(M[j] > M[j+1]) *// if out of order, swap!*

{ temp = M[j];

M[j] = M[j+1];

M[j+1] = temp;

}

}

}

1. Represent the code above using a flow chart. (6 marks)
2. Write down a pseudo code that represents the above algorithm. (6 **Marks)**

**Question 4.**

1. Distinguish between 4, ‘4’, “4” and 4.0 as used in data types of C programming. State the variable declaration of each.(5 marks)
2. State the syntax of if...else statement. Explain how it works using a flow chart.(5 marks)
3. Given the N=100, W=600; write a full C program which computers and prints the:
4. Minimum number .(5 marks)
5. K= .(5 marks)

**Question 5**

The following are the steps identified by the programmer that should be taken to solve the computer problem. Describe what is involved at each step.

(i) Problem definition. (2 marks)

(ii) Problem analysis. (2 marks)

(iii) Algorithm design. (2 marks)

(iv) Program writing. (2 marks)

(v) Testing and debugging. (2 marks)

(vi) Documentation. (2 marks)

1. What do the following escape sequences do? (4 marks)

\b, \n, \t, \a, \v, \\, \”, \’

1. Given the following C- working program, where **y, m, s** are variables of type integer. What will be the values of these variables after the last statement has executed?

#include<stdio.h>

main()

{

int y=72, m=8, s=12;

s=m++;

y/=24 + ++s;

s\*= s + ++y;

s= ++y%m+++7;

printf( " %d\n %d\n %d\n ", y, m, s); (4 marks)

**Question 6**

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