United International University (UIU)

Dept. of Computer Science and Engineering (CSE)

Class Test # 1 Year: **2023** Semester: **Spring**
Course: **CSE 1111** Title: **Structured Programming Language (Sec – A/V)**
Marks: **20** Time: **40 minutes**

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Name:..... **ID:** .....

Q.1 Mark as **True** or **False**: **[3 x 1 = 3]**

a) Header file **stdio.h** must be included used for using **pow( )** function. False

b) Two or more inputs from keyboard can be taken by using a single **scanf** statement. True

c) The expression **(i > j && x < y)** is true if either **i > j** is true or **x < y** is true. False

Q.2 Write down the **status** of the following names of variable. (**Valid** or **Invalid**, if **invalid** then **why?**) **[4 x 0.5 = 2]**

- Qrop% → Invalid (special character is not allowed)
- Sa_yed → Valid
- D1tg → Valid
- 2rui_e → Invalid (cannot start with number)

Q.3 Give **short answers** (2/3 sentences) to the questions below: **[2 x 1.5 = 3]**

a) What are the four **basic data types** in C discussed in the class? Also write their Size in Bytes and possible range of value s it can take.

int → 4 byte 2^{-31} to $2^{31}-1$
float → 4 byte 2^{-31} to $2^{31}-1$
char → 1 byte 2^{-7} to $2^{7}-1$
double → 8 byte 2^{-63} to $2^{63}-1$

b) Why **header files** are used in a C program?

For printf()
scanf()
to ~~func~~ work

Q. 5 Identify the **errors** (syntactical and logical) in the following C program and correct it. Write the **Output** after making the necessary corrections: **[7]**

```
#include<stdio.h>
#include<math.h>
int main ()
{
    int x;
```

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```
scanf("%d", &x);                    // user will enter 40 as input
int y = (x * 5 % 3) % 10 + 9;
int z = ( 91 / 13 + ( 23.0%10 ) ) * ( 34 + ( ( 56.0 / 9 ) ) ) - sqrt(50);
float w = ( ( 56<89 && 67>12) * 6 ) % 23 + ( 10 > 9 - ( 6 <1 || 89 < 100 ) ) * (float ) ++x / 6;
if(y > z+w)
{
        printf("Yes!!\n");
        y = y - 100;
}
else
{
        print("No!!!\n");
        z = z + y++ + 100
}
x = x + w;
printf("The result is: %d %d %d %f", x, y, z, w);
}
```

Answer with output:

No!!!

53 12 506 12.833334

x y z w

x = 40

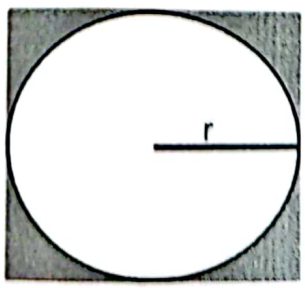
∴ y = 11

∴ z = 395

∴ w = 12.833334

Q. 6 A circle inside a square is given in the following figure. Write a C program to find the shaded area. You can only take the radius of the inner circle and the side of the square as input. **[5]**

$$area\ of\ a\ circle = 3.1416 * r * r, \text{[r is the radius of a circle]}$$
$$area\ of\ a\ square = a * a, [a\ is\ the\ length\ of\ a\ side\ of\ a\ square]$$



```
#include <stdio.h>

int main()
{
    int r, a;
    float area_cir, area_sqr, shade_area;
    scanf("%d %d", &r, &a);
    area_cir = 3.1416 * r*r;
    area_sqr = a*a;
    shade_area = (area_sqr - area_cir);
    printf("%f", shade_area);
    return 0;
}
```

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Name:..... **ID:** .....

Q.1 Mark as **True** or **False**: **[3 x 1 = 3]**

a) The expression **(m<n || x < y)** is true if **m<n** is false or **x < y** is true. False

b) Two or more inputs from keyboard cannot be taken by using a single **scanf()** statement. True

c) Header file **stdio.h** must be included used for using **printf( )** function. True

Q.2 Write down the **status** of the following names of variable. (**Valid** or **Invalid**, if **invalid** then **why?**) **[4 x 0.5 = 2]**

- !New Invalid
- @avg_marks Invalid (Special characters is not allowed)
- val9 Valid
- D lid Invalid (No Blankspace)

Q.3 Give **short answers** (2/3 sentences) to the questions below: **[2 x 1.5 = 3]**

a) Write their Size of the following **data types** in Bytes and the possible range of value s it can take.

- Unsigned int 4 byte 0 to $(2^{32}-1)$
- long double 16 byte -2^{127} to $2^{127}-1$
- char 1 byte -2^{7} to $(2^{7}-1)$
- long long int 8 byte -2^{63} to $(2^{63}-1)$

b) What is the difference between **Pre-increment** and **Post-increment**? Explain with an example?

Pre-increment

```
int x=5;
printf("%d", ++x);
```

↓

6

Post-increment

```
int x=5;
printf("%d", x++);
```

↓

5

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Q. 5 **Compute** the values of the variables a, b, c, and d. [4 x 0.5 = 2

```
float a = (int) 45.0 % 21 << 4;
int b = (10 > 9 || 21 <= 19) * 12 / 3 + 8;
double d = ( 80 & 54) >> 2 ;
int c = 20.0 / 3 * 10 - 4;
```

a = 48.000000
b = 12
d = 4.000000
c = 62

Q. 6 Find the **Area** and **Circumference** of a ***Circle*** with its standard equation [7]

We know the standard equation of a circle is $(x-h)^2 + (y-k)^2 = r^2$

Where, (x,y) are two points on the circle

(h,k) are the center coordinates on the circle,

r is the radius of the circle.

The user will input x,y in one line and h,k in another line and the program will output the *area* (π * **radius**^{2}) and *circumference* (**2*π*radius**) of the circle. Use formatting of output as:

Sample Input	Sample Output
Enter two points on circle: 1 2 Enter center of circle: 2 5	Area: 31.416 Circumference: 19.869

```
#include <stdio.h>
#include <math.h>
#define pi 3.1416
int main()
{
    int x, y, h, k;
    float area, circumference, r;
    printf("Enter two points on circle: ");
    scanf("%d %d", &x, &y);
    printf("Enter center of circle: ");
    scanf("%d %d", &h, &k);
```

```
r = sqrt (pow(x-h,2) + pow (y-k,2));
area = pi *r*r;
circumference = 2*pi*r;
printf ("Area: %.f\n", area);
printf ("Circumference: %.f\n", circumferenee);
return 0;
}
```

Q.7 Rewrite the following code after correcting the errors. Also show the output if the input is 14. [3]

```
#include<studio.H>
#include<math.h>
void Main (){
    Float n_, m = 5;
    scanf("%d", n_)
    float p = (n_%m)/sqrt(6;
    printf("%d", P);
    return 0;
}
```

```
#include <stdio.h>
#include<math.h>

void main()
{
   float n_, m=5;
   scanf ("%f", &n_);
   float p = (n_ % m)/ sqrt(6);
   printf ("%f", p);
   return 0;
}
```

Output: p = 1.632993