University of Kelaniya – Sri Lanka

Centre for Distance & Continuing Education

Bachelor of Science (General) External

First year First semester examination - 2019

(New Syllabus)

2022 August

Faculty of Science

Computer Science / Computer Studies

COSC 16523 / COST 16523 – Fundamentals of Programming

Name:..... **Student No:**.....

No. of Questions: **Six (06)** No. of pages: **Five (05)** Time: **Three (03) hours**

Answer **All** Questions

1.

(a) State whether each of the following statements is *true* or *false*. If your answer is *false*, give reasons.

(i) C considers the word ***function*** as a key word.

(ii) C assignment operators are evaluated from left to right.

(iii) If `a=20` and `b=2`, then the final value of *x* and *y* should be same after independently executing the statements `x=++a+b` and `y=a+b`.

(iv) The expression `(p>q && m<n)` is not true if `p>q` is true and `n<=m` is false.

(b) Write the output produced by the following C code segments.

```
int a=3, b=7, c=13, d = 2;

a = c / a;
b = b - c % d++;
c = ++a * (b + 5);
d = c-- * b / 7;

printf("a= %d b= %d c= %d d = %d\n",a,b,c,d);
```

(c) Write single C statement to accomplish each of the followings:

(i) Declare an integer variable ***p*** and assign 12 to it.

(ii) Assign the sum of ***m*** and ***n*** to ***k*** and then decrement the value of ***m*** by 1.

(iii) Declare a one dimensional character array ***text*** and give the initial value as `"Programming"`.

(iv) Print the value 61. 4256 right aligned, with a minimum field width of 10 and a maximum of two decimal places.

(v) Test if the value of the variable total is greater than 50. If it is, print the message `"Pass"` else print the message `"Fail"`

2.

(a) Consider the following problem:

Program that reads employee's number of hours worked and the wage per hour. Then, it calculates the weekly wage of an employee. If the employee has worked for more than 40 hours, then he or she gets twice the wage per hour, for every extra hour that he or she has worked.

(i) Draw a flow chart to solve the above problem.

(ii) Convert the flow chart into a valid C program.

(b) Consider the following code segment:

```
if (m = 1)
     printf("red\n");
else if (m = 2)
     printf("blue\n");
else
     printf("green\n");
```

(i) Explain the effect of the above code segment.

(ii) Rewrite the above code segment using a "switch" statement.

3.

(a) The following statements are part of a C program in which both the x and y are integers. What are the values of x and y in each of the following?

(i)
```
x=3, y=2;
if(x<y)
x = x + 2;
if(x>y)
y = y + 2;
```

(ii)
```
x=0, y=0;
if(x==y){
x =2;
y =2;}
else {
y =2;
x =5;}
```

(iii)
```
x=1, y=5;
for(i=1;i<5;i= i + 2){
x = x + i;
y = y * (i++);}
```

(iv)
```
x=1, y=2;
while(x+y<12){
x++;
y++;}
```

(b) Write the necessary C code segment to implement the following scenario.

Assign a value to double variable `cost` depending on the value of integer variable `distance` as follows:

Distance	Cost
0 through 100	5.00
More than 100 but not more than 500	8.00
More than 500 but less than 1,000	10.00
1,000 or more	12.00

(c) Write the necessary C code segment to implement the following scenario.

Assign a value to variable `n` depending on the value of the integer variable `x` as follows:

x	n
$x = 0$	4
$\|x\| = 2$	1
$x = 7$	7
otherwise	0

4.

(a) What is the output of the following code segment?

```
count = 1;
while(count <= 4)
{
      innerCount = 1;
      while(innerCount <= (7 - count)/2)
      {
            printf("*");
            innerCount++;
      }
      innerCount = 1;
      while(innerCount <= count)
      {
            printf("@");
            innerCount++;
      }
      printf("\n");
      count++;
}
```

(b) Consider the following code segment:

```
int i=0,x=0;
while(i<20)
{
      if(i%5==0){
      x++;
      printf("%d",x);
      }
      ++i;
}
printf("\n x=%d",x);
```

(i) What is the minimum number of times that the while loop would execute?
(ii) Give the output of the code segment.
(iii) Replace the while statement in the above code segment with a do-while statement.

(c) Write a complete C program to sums all values between 10 and 100 into a variable called `total`. Then, display the value of the `total` variable.

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