

Department of Higher Education
University of Computer Studies, Yangon
First Year (B.C.Sc./B.C.Tech.)
Computer Programming Techniques (CST-104)
Final Examination
October, 2018

Answer **ALL** questions.

Time allowed : 3 hours.

1. What is the output of the program? (Write the output result only.) (15 marks)

```
(a)  int i, j, k;
      for (i = 1; i <= 7; i++)
      {   for (j = 1; j <= i; ++j)
          cout << j;
          for (k = 7 - i; k >= 1; k--)
          cout << " * ";
          cout << " ";
      }

(b)  int num = 3;
      int x = 41, y = 43;
      x = y++ + x++;
      y = ++y + ++x;
      cout << "x = " << x << "\n y = " << y << endl;
      for (int i=0; i<num; i++)
      {   switch ( i + 1)
          {   case 1 :   printf("Case 1: ");
              case 2 :   printf("Case 2: ");
              case 3 :   printf("Case 3: ");
              default :   printf("Default: ");
          } cout << endl;
      }

(c)  void main()
      {   int a = 5, b;   int *ptr;
          char name[20]="Thinn Thinn";
          ptr = &a;   b = *ptr;
          cout << strlen(name) << endl;
          cout << *ptr << "\t" << b << endl;
          cout << strcmpi(name, "thin thin") << endl;
          cout << name << endl;
      }
```

2. Which of the following lines are correct and which have errors? If error, correct them.

Please answer as follows:

(15 marks)

Line () is correct.

Line () is error. Correct syntax is =// Answer for correct

(a) #include<iostream.h>

Line 1: float lbstokg(float)

Line 2: void main();{

Line 3: float lbs, kgs;

Line 4: cout << "\nEnter your weight in pounds:";

Line 5: cin >> lbs;

```

Line 6:   kgs == lbstokg(lbs);
Line 7:   cout<<"Your weight in << pounds<< " = " << kilograms << "kgs"<<endl;
Line 8:   return 0; }
Line 9:   float lbstokg(float pounds);
Line 10:  { float kilograms = 0.453592*lbs;
Line 11:  return kgs;

```

(b) Correct the following if statement using the conditional operator (? :).

```

if ( x<=40) if (x<40) ans = 100 ;
    else ans = 300; else ans = 150;

```

(c) Correct the codes below to generate the output as 1 * 4 * 9 * 16 * 25 * 36 * 49.

```

for ( int i = 1; i > 1; i )
    cout << i " * ";

```

3. Write the short code segments as the given instructions: (15 marks)

(a) Write a program that accept the array of char(string) input from user and then copy that character array to another character array without using strcpy() library function.

(b) Write a function that, when you call it, display a message telling how many times it has been called: "I have been called 3 times", for instance. Write a main() program that calls this function at least 10 times. Try implementing this function using global variable or local static variable. Which is more appropriate?

(c) Define a structure called **Date** that includes three members; day, month and year, all of type integer and an enumerated data type called **stutype** which includes four type of students: bachelor, master, phd and researcher. Then also define structure called **Student** that includes four members; roll number of type integer, student_name of type char[], student_type of type enum stutype and date of birth of type struct Date.

4. Describe the concerned header file for the following instructions to run properly. (5 marks)

(a) clrscr();	(b) tolower(ch);
(c) exit(0);	(d) fopen("student.dat", "w+");
(e) sqrt(num);	

5. (a) Write a program that checks whether a triangle is valid or not. A triangle is valid if and only if the sum of its any two sides is greater than the third side. If this is true for all three combinations, then you will have a valid triangle. Your program should repeatedly ask user to enter the three side of a triangle and display if the triangle is valid or not. Further if the triangle is valid, your program should display its type. A triangle is an Equilateral Triangle, if all its sides are equal. A triangle is an Isosceles Triangle, if its two sides are equal. A triangle is a Scalene Triangle, if none of its sides are equal. A triangle is a Right Triangle, if the sum of the square of its two sides is equal to the square of the third side.

The program interaction is :

```

Enter three sides : 2 2 3
Triangle is valid. Isosceles triangle.
Do you wish to continue(y/n)? y
Enter three sides : 1 1 3
Triangle is not valid.
Do you wish to continue(y/n)? n

```

- (b) The `getche()` library function processes each character typed by the user without waiting for an Enter key. Write a program that inputs a phrase typed until the 'Enter' key by the user using `getche()` function. Then display total word counts and total characters count inputted by user. The interaction of the program might look like this:

Enter a phrase : this is a text

Total word count = 4

Total character count = 11 (15 marks)

6. (a) Write the program that assigns the 10 integer numbers to the array. Assume that the elements in the array have been sorted already and use **Binary search** to find the user's desired key value. If the key is found in that array, display the message 'Key value xxx is found' and the **position** of key found in the array. If the key is not found, display the message 'Key value xxx is not found'.

- (b) Create a structure called `sterling` that stores money amounts in the old-style British system. The members could be called `pound`, `shilling`, `pence`, all of type `int`. The program should ask the user to enter a money amount in new-style decimal pounds (type `double`), convert it to the old-style system, store it in a variable of type `struct sterling`, and then display this amount in pounds-shillings-pence format. The interaction of the program is

Enter decimal pounds: 3.51

Equivalent in old notation : £ 3.10.2 (15 marks)

7. Answer **ANY TWO** of the followings:

- (a) Raising a number `n` to a power `p` is the same as multiplying `n` by itself `p` times. Write a function called `power()` that takes a double value for `n` and integer value for `p`, and returns the result as a double value. Use a default argument of 2 for `p`, so that if this argument is omitted, the number `n` will be squared. Create a series of overloaded functions with the same name that, in addition to `double`, also work with types `char` and `float`. Write a `main()` program that exercises these overloaded functions with all argument type.

- (b) Write a program that accepts 10 numbers from user and stores them in an array and sorts these data. To sort data, write two functions: `bsort()` function to sort these numbers in descending order and `swap()` function to swap the numbers. Your program should display data before sorting and after sorting. Use pointer notation wherever possible.

- (c) Write a program to create a text file named "part.txt" which stores part information. The part information is stored in the file line by line and separated by space. The input data may be `part_name` (type `char[]`), `part_no` (type `int`) and `cost` (type `float`) and the data are input from the user. Then the data is written to text file until the user entered "N". The interaction of the program is :

Enter part name : Screw

Enter part number :23

Enter cost :32.75

Any more (Y or N) ? : Y

Enter part name : Wire

Enter part number :2

Enter cost :2.50

Any more (Y or N) ? : N (20 marks)
