Functions

Question 1

- ➜ The formula to calculate the volume of a cone is $\frac{1}{3}\pi r^2 h$. The radius is r and the height of the cone is h.
- ➜ Task 1:
  - In one program:
    - Ask the user to enter the radius and height of the cone.
    - Calculate the volume. Set as constant using **const**.
    - Display as shown below.

SAMPLE OUTPUT

```
Enter radius and height of cone : 3.5 7

The Radius is : 3.50
The Height is : 7.00
The Volume is : 89.81
```

- ➜ Task 2 (Using user-defined function):
  - In *main()*:
    - Ask the user to enter the radius and height of the cone.
    - Call function get_volume(…) and pass radius and height
    - Display as per sample output in Task 1.
  - In get_volume(…):
    - Calculate and return the volume.

Question 2

a) What is the output for the following program?

```
#include<stdio.h>

int Func1(int,int);
void Func2(int);

void main()
{
      int x=5, y=10, z=2, result=0;

      result = z + Func1(x,y);

      printf("Result is : %d\n", result);
      Func2(result);
}
int Func1(int a, int b)
{
      return (b-a);
}
void Func2(int a)
{
      int b=3;
      printf(" %d\n %d\n", a, a*b);
}
```

b) What is the output for the following program?

```
#include<stdio.h>

void f1(int a)
{
      int result = 1;
      result = result * a;
      printf("%d\n", result);
}
void main( )
{
      int result = 1;
      f1(result++); f2(result++);
      printf("%d\n", result);
}
void f2(int a)
{
      int result = 1;
      result = result * a;
      printf("%d\n", result);
}
```

Question 3

The following program is not complete, write the code based on the instructions from (i) to (vii).

(i) Create a function prototype for a function called *getMod* that accepts 2 integer arguments. This function will return an integer value.
(ii) Create a function prototype for a function called *print* that accepts 1 integer argument. This function does not return any value.
(iii) Call function *getMod* and pass num1 and num2 to the function.
(iv) Call function *print* and pass result to the function.
(v) Create a function header for function *getMod*.
(vi) Return ans back to the caller.
(vii) Create a function header for function *print*.

```
#include<stdio.h>

.....(i).....
.....(ii).....

void main()
{
      int num1,num2,result;

      printf("Enter 1st number: ");
      scanf("%d", &num1);
      printf("Enter 2nd number: ");
      scanf("%d", &num2);

      .....(iii).....
      .....(iv).....
}
.....(v).....
{
      int ans;
      ans = a % b;
      .....(vi).....
}
.....(vii).....
{
      printf("The final answer is: %d", ans);
}
```

Question 4

Below is a program that determines the salary grade for a government worker.

```
#include<stdio.h>
void main()
{
     float salary;

     printf("Enter your monthly salary: ");
     scanf("%f", &salary);

     if (salary < 5000)
          printf("Your salary grade is GM40\n");
     else if (salary < 10000)
          printf("Your salary grade is GM43\n");
     else
          printf("Your salary grade is GM45\n");
}
```

Modify the above program so that the program includes the following functions:

(i) A non-void function named GetSalary(), which reads a salary value from user and return the value to main().

(ii) A function named DisplayGrade(), which accepts the salary from main() and display the salary grade.

Question 5

Write a program that determines the grade of student based on the mark entered.

- In main()
  - Ask the user to enter their mark (0-100).
  - Call function *getrade.*
  - Display the grade.
  - Repeat for three times using for-loop. return = means no void

- In function *getgrade*:
  - Using if-else statement to determine the appropriate grade based on table below.
  - Return the value to main().

[Tips: Implement the function successfully first before adding the for-loop]

Mark	Grade
80-100	A
70 to < 80	B
50 to < 70	C
0 to < 50	F

SAMPLE OUTPUT

```
Enter mark 1     : 49.99
Your grade is    : F

Enter mark 2     : 70
Your grade is    : B

Enter mark 3     : 80
Your grade is    : A
```

Question 6

- In main():
  - Ask the user to enter the number of products purchased.
  - Using for-loop
    - Ask for price and quantity of the product depending on number of product purchased.
    - Call function *getbill* and send the *price* and *quantity* as argument.
    - Display the total bill for the product.

- In function *getbill*(...):
  - Calculate the total bill (price * quantity).
    - Return value to main().

SAMPLE OUTPUT

```
Enter number of products purchased: 3

Enter Product 1 price            : RM45.5
Enter the quantity ordered       : 4
Total bill                       : RM182.00

Enter Product 2 price            : RM100
Enter the quantity ordered       : 5
Total bill                       : RM500.00

Enter Product 3 price            : RM17.20
Enter the quantity ordered       : 10
Total bill                       : RM172.00
```