1. A function prototype is used for
   a) Declaring the function logic
   b) Calling the function from the main body
   c) Telling the compiler, the kind of arguments used in the function
   d) Telling the user for proper use of syntax while calling the function

Solution: (c) A function prototype tells the compiler what kind of arguments a function is looking to receive and what kind of return value a function is going to give back. This approach helps the compiler ensure that calls to a function are made correctly and that no erroneous type conversions are taking place.

2. The variables that are declared inside a function are
   a) global variable
   b) local variables
   c) static variables
   d) must be same as the variables declared in main().

Solution: (b) The variables which are declared inside a function are local variables.

3. Nested functions are the functions which
   a) calls itself
   b) calls the main function multiple times
   c) calls another function
   d) define another function inside it

Solution: (c) Nested functions calls another function from it.

4. What is the output of the following C program?

```
#include <stdio.h>
void foo(), f();
int main()
{
   f();
   return 0;
}
void foo()
{
   printf("2 ");
}
void f()
{
   printf("1 ");
   foo();
}
```

   a) Compiler error as foo() is not declared in main
   b) 1 2
   c) 2 1
   d) Compile time error due to declaration of functions inside main

Solution: (b) The function f() is called from the main. After printing ‘1’, foo() will be called and ‘2’ will be printed. This is an example of nested function.

5. This Question is deleted and reevaluated.

6. What is the return-type of the function sqrt()
   a) int
   b) double
   c) float
   d) depends on compiler

Solution: (b) sqrt is a math function which returns ‘double’ type data.

7. What is the default return type if it is not specified in function definition?
   a) void
   b) integer
   c) double
   d) float

Solution: (b) Integer is the default data type if not specified in the function.

8. What is the error in the following program

```
#include<stdio.h>
int f(int a)
{
 a > 20? return(10): return(20);
}
int main()
{
  int b;
  b = f(20);
  printf("%d\n", b);
  return 0;
}
```

   a) Error: Return statement cannot be used with conditional operators
   b) Error: Prototype declaration
   c) Error: Two return statements cannot be used in any function
   d) No error

   Solution: (a) In a ternary operator, we cannot use the return statement. The ternary operator requires expressions but not code.

9. How many times ‘Hi’ will be printed in the program given below

```
#include<stdio.h>
int i;
int fun();

int main()
{
  while(i)
  {
    fun();
    main();
  }
  printf("Hello\n");
  return 0;
}
```

```
int fun()
{
   printf("Hi");
}
```

a) Only once
b) Zero times
c) Infinite times
d) Compilation error

Solution: (b) The default value of i is ‘0’. Thus, the while loop will never be executed and the control will not come into the function. Thus, ‘Hi’ will never be printed.

10. What is the output of the C code given below

```
#include <stdio.h>
float func(float age[]);
int main()
{
   float result, age[] = { 23.4, 55, 22.6, 3, 40.5, 18 };
   result = func(age);
   printf("Result is=%0.2f", result);
   return 0;
}

float func(float age[])
{
   int i;
   float result, sum = 0.0;
   for (i = 0; i < 6; ++i) {
      sum += age[i];
   }
   result = (sum / 6);
   return result;
}
```

a) 27.08
b) 27.083334
c) Compiler error as result is declared twice
d) Error: Invalid prototype declaration

Solution: (a) The program finds the average of the array elements. As the variables declared in the function are local, they can be used in the main as well. 0.2f will print two decimal points. Thus the output is 27.08.

11. What is the output of the following C program?

```
#include <stdio.h>
int fun(int n)
{
   int i, j, sum = 0;
   for(i = 1;i<=n;i++)
      for(j=i;j<=i;j++)
         sum=sum+j;
   return(sum);
}
```

```
int main()
{
   printf("%d", fun(5));
   return 0;
}
```

Solution: The program finds the sum of the integer numbers till 5. Thus the output is 15.

12. What will be the output?

```
#include <stdio.h>
int swap(int a, int b)
{
   int temp;
   temp = a;
   a = b;
   b = temp;
}

int main()
{
   int num1 = 10, num2 = 20;

   printf("Before swapping num1 = %d num2 = %d\n", num1, num2);
   swap(num1, num2);
   printf("After swapping num1 = %d num2 = %d \n", num1, num2);
   return 0;
}
```

a) Before swapping num1 = 10 num2 = 20

   After swapping num1 = 10 num2 = 20

b) Before swapping num1 = 10 num2 = 20

   After swapping num1 = 20 num2 = 10

c) Before swapping num1 = 10 num2 = 20

   After swapping num1 = 20 num2 = 20

d) Before swapping num1 = 10 num2 = 20

   After swapping num1 = 10 num2 = 10

Solution: (a) Before swapping num1 = 10 num2 = 20

After swapping num1 = 10 num2 = 20

In function swap, receive the parameters through variables a and b respectively. Copied the value of variable a to the variable temp. Copied the value of variable b to the variable a and copy the value of variable temp to the variable b. This will do the swapping ONLY in the swap() function, but it will NOT change the value of variables in the main() function.

13. In general functions in C returns
    a) Multiple values
    b) Single value
    c) Returns nothing
    d) None

Solution: (b) Single value

14. Which statement is correct about Passing by value parameters?

    a) It cannot change the actual parameter value
    b) It can change the actual parameter value
    c) Parameters is always in read-write mode
    d) None of them

Solution: (a) It cannot change the actual parameter value

15. What will be the output?

```
#include<stdio.h>
int func(int n, int sum)
{
int k = 0, j = 0;
if (n == 0) return;
        k = n % 10;
j = n / 10;
sum = sum + k;
func(j, sum);
printf("%d,", k);
}

int main()
{
int a = 2048, sum = 0;
func(a, sum);
printf("%d ", sum);
return 0;
}
```

    a) 8 ,4, 0, 2, 14
    b) 8, 4, 0, 2, 0
    c) 2, 0, 4, 8, 14
    d) 2, 0, 4, 8, 0

Solution: (d) 2, 0, 4, 8, 0
sum has no use in func(), it is there just to confuse. Function func() just prints all digits of a number. In main, there is one more printf statement after func(), so one more 0 is printed after all digits of n.