Patuakhali Science and
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Course code CIT 111, 112

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Assignment : 02
Title : Chapter 3 Solution
(Theory)

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Choose the correct answer for each of the following multiple choice questions

3.1 Which of the following escape sequences moves the cursor position to the new line?

(a) \n (b) \r (c) \t (d) \v

Ans: (a) \n

3.2 Which of the following is not a C language keyword

(a) Volatile (b) enum (c) unsigned (d) go

Ans: (a) Volatile

3.3 Which of the following is the correct way of specifying long signed integer data type?

Ans: (a) signed long int (b) long int

(c) unsigned long int (d) Both 1 and 2

Ans: (d) Both 1 and 2

3.4 Which of the following is not a C storage class?

(a) auto (b) static (c) register (d) volatile

Ans: (d) volatile

3.5 Which of the following is the correct way of defining a symbolic constant?

(a) # define MAX_MARKS 100

(b) # define MAX_MARKS 100

(c) # define 100 MAX_MARKS

(d) # define 100 MAX_MARKS

Ans: (a) (b) # define MAX_MARKS 100

3.6 Which of the following statement is true about character constants?

(a) The statement printf("%c", '97'); will print a

(b) Each character constant represents an integer value

(c) It is possible to perform arithmetic operations on character constants

(d) All of the above

Ans: (b) Each character constant represents an int value

3.1 Review Questions

state wheather the following statements are true/false

(a) All variables must be given a type when they are declared. Ans: true

(b) Character constants are coded using double quotes

Ans: False

(c) ANSI C treats the varciables name and ~~N~~name to be same. Ans: False

(d) The keyword void is a data type in C. Ans: true

(e) Character constants are ~~coded~~ enclosed in single quotes while string constants are enclosed in double quotes.

Ans: True

(f) Initialization is the process of assigning a value to a variable at the time of declaration.

Ans: False

(g) The scanf function can be used to read only one value at a time.

Ans: False

(h) C allows its keywords to be also used as ~~iden~~ identifiers.

Ans: False

(i) Auto variables are by default initialized to 0 as soon as they are declared.

Ans: False

(j) Floating point constants, by default, denote float type values.

Ans: True

(k) Like variables, constants have a type.

Ans: True

(l) All static variables are automatically initilized to zero.

Ans: False

3.2 Fill in the blanks with appropriate value

(a) A variable can be made constant by declaring it with the qualifier const at the time of initialization.

(b) 255 is the largest value that an unsigned short int type variable can store.

(c) A global variable is also known as external variable.

(d) The keyword typedef can be used to create a data type identifier.

(e) If the number 987612347 is to be used as an unsigned long integer then it must be appended by UL.

(f) typedef and enum are used to define user-defined data types in C.

(g) The largest positive integer value can be stored in long double type variable.

3.3 What are trigraph characters? How are they useful?

Ans. Trigraph characters are some English symbols like caret, tilde, which may not be supported in non-English keyboards. They are useful to extend our set of characters in programming.

3.4 Describe the four basic data types. How could we extend the range of values they represent?

Ans: Basic four data types are integers, characters, floating point and void. Void contains no data. Integer are whole numbers where characters can store ANSI characters. similarly floating can contain real numbers. We can extend the range of values by using modifiers like unsigned, long e.t.c.

3.5 What is an unsigned integer constant? what is the significance of defining a constant unsigned?

Ans: Unsigned integer constant means integers without negative values. For example, integers can be zero, or positive or negative. But if we omit negatives we'll get one more bit to store a value and thus our range becomes larger. So defining a constant unsingned integer can give us more space to put our integers.

3.6 Describe the characteristics and purpose of escape sequence characters

Ans: Escape seauence characters are combination of a baneslash and a character. They nave special meanings in output functions. We use them for ~~repreent~~ decorating or tweaking our outputs like placing a new line, etc.

3.7 What is a variable? and what is meant by the 'value' of a variable?

Ans: A variable is a data name that may be used to store a data value. And this value can be changed over time. And the value can be of any data type like, integer or floating or character. Value has a specific characteristics. For example, for integers we must use a number.

3.8 How do variables and symbolic names differ?

Ans: Variables and symbolic names both can store data. But variables can be changed over time. But symbolic names keep constant value. They are defined with # define keyword at the beginning of a program. Which improves readability a lot for a code. Besides symbolic names make it easy to modify the code easily.

3.9 State the differences between the declaration of a variable and definition of a symbolic name.

Ans: Declaring a variable will create a variable in the stack memory and it can be changed over time. But defining a symbolic name will create a constant which is created in the data area.

3.10 What are the qualifiers that int can have at a time?

Ans: Int can have either signed or unsigned and either short or long qualifier.

3.11 A programmer would like to use the word DPR to declare all the double-precision floating point values in his program. How could he achive this?

Ans: He could use typedef to set DPR instead of double. He has to write:

```
typedef double DPR;
```

3.12 What are enumeration variables? How are they declared? What is the advantage of using them in a program.

Ans: Enumeration variables are user defined data type variable which can be used to declare ~~variabl~~ and can have one of the values enclosed within the braces. They are declared like,

enum identifier {val1, val2, ..., valn};

They are used to make memory efficient codes.

3.13 Describe the purpose of the qualifiers const and volatile.

Ans: Const qualifier makes a variable constant and thus it cannot be changed over time where volatile qualifier is to tell the compiler explicitly that a variable's value may be changed at any time.

3.14 When dealing with very small or very large numbers, what steps you take to improve the accuracy of the calculations?

Ans: To deal with small number we can use short modifier or for large number we can use long modifier.

3.15 Which of following are invalid constants and why?

0.0001 5X1.5 ,,,,, +100

75.15E-2 "15.75" -45.6 -1.79·e+4

0.00001234

Ans: 5X1.5 is invalid. Because we can't use "X".

75.15 E-2 is invalid. Because there is a space before E.

-1.79 e+4 is invalid. Because there are spaces in between.

3.16 Which of the following are invalid variable names and why?

~~Ans~~: Minimum First.name n1+n2 double$ 3rd_row n$ Row1 float Sum Total Row Total Column-total

Ans: First.nam = '.' sign not allowed

n1+n2 = '+' sign not allowed

3rd_row = number at the biggining not allowed

float = float is a c keyword.

RowTotal/Sum Total = space in between not allowed

Column-total = hyphene not allowed.

3.17 What would be the value of x after execution of the following statements?

```
int x, y = 10;
char z = 'a';
x = y + z;
```

Ans: x will be 107. Because ascii value of 'a' is 97.

3.18 Explain the following with examples:

(a) Enumerated types

(b) Type def

Exa Ans:

(a) Enumerated types are user defined data type variable which can be used to declare and can have one of the values enclosed within the braces. They are delared like,

```
enum identifier {val1, val2, val3};
```

(b) Typedef is used to set a user defined name to a data type. For example

```
typedef double DOU;
```

3.19 Distinguish between the following

(a) Global and local variables

(b) Initialization and assignment of variables

(c) Automated and static variables

Ans:

(a) Global variables can be accessed from any functions. We don't need to call by value or call by reference. On the other hand, local variables can be only accessed from a specific function or block.

(b) Initialization of a variable means it'll be on the stack memory without value. And assignment means to assign a value to a variable.

(c) Automated variable are variables with default state. They don't contain any value until assignment. On the other hand static variable contains zero automatically while declaration.

3.1 Find errrors, if any in the following declaration statements

```
Int x;
float letter, DIGIT;
double = p, q;
exponent alpha, beta;
m, n, z: INTEGER
short char c;
long int m; count;
long float temp;
```

Ans: Correct declarations are,

```
int x;
float letter, DIGIT;
double p, q;
double alpha, beta;
int m, n, z;
char c;
long int m, count;
long float, temp;
```

3.2 Identify syntax errors in the following program. After corrections, what output would you expect when you execute it?

```
#define PI 3.14159
main()
{
  int R, C;
  float perimeter;
  float area;
  C = PI;
  R = 5;
  Perimeter = 2.0 * C * R;
  Area = C * R * R;
  printf("%f", "%d", &perimeter, &area);
}
```

Ans: First we have to add and change to

```
#include <stdio.h>
int main()
```

then we have to use previously declared variables with right name,

```
perimeter = 2.0 * C * R;
area = C * R * R;
```

then we've to change print function

```
printf("%f %d", perimeter, area);
```

And we'll get perimeter and area as output

INTERVIEW QUESTIONS

3.1 Is it possible to declare an identifier that starts with an underscore?

Ans: Yes, we can declare an identifier that starts with an underscore.

3.2 Is it possible to declare an identifier that ends with an underscore?

Ans: Yes, it is possible to declare an identifier that ends with an identifier.

3.3 What is the return type of printf function?

Ans: printf function returns an integer value which tells how many characters were printed.

3.4 What is the difference between delarcing and ~~definition~~ defining a variable?

Ans: Declaring a variable means to create an empty variable without a value. And defining means allocating it with a value.

3.5 What is long long int?

Ans: Long long int is a variable which can store more than int or long int.

3.6 What is the return type scanf function?

Ans: Integer