

DEPARTMENT OF INFORMATION TECHNOLOGY
PROGRAMMING IN C [I B.Sc. IT]
CHECK LIST – UNIT I

➤ **Constants, Variables and Data types**

- Introduction
- Character set
- C Tokens
- Keywords and identifiers
- Constants
- Variables
- Data types
- Declaration of variables
- Declaration of storage class
- Assigning values to variables
- Defining symbolic constants
- Declaring a variable as constant
- Declaring a variable as volatile
- Overflow and underflow of data

➤ **Operators and Expressions**

- Arithmetic operators
- Relational operators
- Logical operators
- Assignment operators
- Increment and decrement operators
- Conditional operator
- Bitwise operator
- Special operators
- Arithmetic expressions
- Evaluation of expressions
- Precedence of arithmetic operators
- Some computational problems
- Type conversions in expressions
- Operator precedence and associativity
- Mathematical functions

DEPARTMENT OF INFORMATION TECHNOLOGY
PROGRAMMING IN C [I B.Sc. IT]
CHECK LIST – UNIT II

➤ **Managing Input And Output Operations**

- Reading a character
- Writing a character
- Formatted input
- Formatted output

➤ **Decision Making and Branching**

- Decision making with if statement
- Simple if statement
- The if else statement
- Nesting of if else statement
- The else if ladder
- The switch statement The ?: operator
- The go to statement

➤ **Decision Making and Looping**

- The while statement
- The do statement
- The for statement
- Jumps in loops
- Concise test expressions

DEPARTMENT OF INFORMATION TECHNOLOGY
PROGRAMMING IN C [I B.Sc. IT]
CHECK LIST – UNIT III

➤ **Arrays**

- One dimensional arrays
- Declaration of one dimensional arrays
- Initialization of one dimensional arrays
- Two dimensional arrays
- Initializing two dimensional arrays
- Multi-dimensional arrays
- Dynamic arrays
- More about arrays

➤ **Character Arrays and Strings**

- Declaring and initializing string variables
- Reading strings from terminal
- Writing strings to screen
- Arithmetic operations on characters
- Putting strings together
- Comparison of two strings
- String handling functions
- Table of strings
- Other features of strings

➤ **User Defined Functions**

- Need for user defined functions
- A multi- function program
- Elements of user defined functions
- Definition of functions
- Return values and their types
- Function calls
- Function declaration
- Category of functions
- No arguments and No return values
- Arguments but no return values
- Arguments with return values
- No arguments but returns a values
- Functions that return multiple values
- Nesting of functions
- Recursion
- Passing arrays to functions
- Passing strings to functions
- The scope, visibility and lifetime of variables

DEPARTMENT OF INFORMATION TECHNOLOGY
PROGRAMMING IN C [I B.Sc. IT]
CHECK LIST – UNIT IV

➤ **Structure and Unions**

- Defining the structure
- Declaring structure variables
- Accessing structure members
- Structure initialization
- Coping and comparing structure variables
- Operations on individual members
- Arrays of structures
- Arrays within structures
- Structures within structure
- Structures and functions
- Unions
- Size of structures
- Bit fields

➤ **Pointers**

- Understanding pointers
- Accessing the address of a variable
- Declaring pointer variables
- Initialization of pointer variables
- Accessing a variable through its pointer
- Chain of pointers
- Pointer expressions
- Pointer increments and scale factor
- Pointer and arrays
- Pointers and functions arguments
- Functions returning pointer
- Pointer to functions
- Pointers and structures
- Troubles with pointers

➤ **File Management in C**

- Defining and opening a file
- Closing a file
- Input and output operations on files
- Error handling during I/O operations
- Random access to files
- Command line arguments

DEPARTMENT OF INFORMATION TECHNOLOGY
PROGRAMMING IN C [I B.Sc. IT]
CHECK LIST – UNIT V

➤ **Dynamic Memory Allocation and Linked Lists**

- Dynamic memory allocation
- Allocating a block of memory : malloc
- Allocating multiple blocks of memory: calloc
- Releasing the used space: free
- Altering the size of a block: realloc
- Concepts of linked lists
- Advantages of linked lists
- Types of linked lists
- Pointers revisited
- Creating a linked list
- Inserting an item
- Deleting an item
- Application of linked lists

➤ **The Pre-processor**

- Macro substitution
- File inclusion
- Compiler control directives
- ANSI additions

UNIT WISE QUESTIONS
PROGRAMMING IN C [I BSC IT]
UNIT I

2 MARKS [with page numbers]

1. What is known as information? – 22
2. What are trigraph characters? How are they useful? - 22
3. What is program? -22
4. What are the group of characters in C program? -22
5. What is known as C tokens? – 24
6. Write the rules for identifiers? – 25
7. What are the three types of integers? – 25
8. Write down the basic types of Constants? – 26
9. Define the variables – 29
10. What are the five main conditions for variable names? -29
11. What are the three classes of data types? – 31
12. Write the syntax for declaring a variable with example program- 33
13. How you can use scanf function? Give an example code – 41
14. What are the categories of Operators in C? – 52
15. Define the operator - 52
16. What are the rules for ++ and – operators? – 60
17. Define the Arithmetic expressions. – 63
18. What are the difference between Algebraic expression and C expression? – 63
19. Write the rules for Evaluation of expression. – 66
20. Write an example C program for expression – 66
21. What is implicit type Conversion and Explicit Conversion? – 68 and 69
22. Draw the diagram for conversion hierarchy. – 69

5 MARKS

1. Write the short notes on Data types – 30
2. Write the C program of assignments – 40
3. Write an example C program for arithmetic operator – 62

10 MARKS

1. Describe the Constants – 25
 - Integer constants
 - Real constants
 - Single character constants
 - String constants
 - Backslash character constants
2. Explain the Operators in C program – 52
 - Arithmetic operators
 - Relational operators
 - Logical operators
 - Assignment operators
 - Increment and decrement operators
 - Conditional operator
 - Bitwise operator
 - Special operator

UNIT WISE QUESTIONS
PROGRAMMING IN C [I BSC IT]
UNIT II

2 MARKS [with page numbers]

1. Which function is used to read a single character? – 84
2. Write the program for getchar() function? – 84
3. Write the program to test the character type? – 86
4. What is syntax for writing characters in C program? – 87
5. Write the program for reading of strings – 92
6. Write any four rules for scanf – 96
7. Write any five printf statements – 97
8. What are the decisions making statements? – 112
9. Draw the flowchart of if – else control. -117
10. Write the general form of swith statement. – 127
11. Draw the two flowcharts of loop control structures – 152
12. What are the two categories of loops? - 153

5 MARKS

1. Write the program for reading and writing of alphabets in reverse cast. – 87
2. Write the program for reading integers using scanf. – 89
3. Write the program for conversion specification%[] for strings – 93
4. Write the program for printing the characters and strings – 101
5. Describe the IF statement. – 113
6. Write the program for simple IF statement – 114
7. Write the program for IF for counting – 115
8. Write the program for if-else statement – 119
9. Draw the flowchart of nested if – else statement – 121
10. Draw the flowchart of else – if ladder – 125
11. Write the program for switch statement to read and print the months - 130
12. Write the example program for conditional operator – 133
13. Write the two categories of loops and describe it. – 153
14. Write the program for while loop – 155
15. Write the program to print 'Power of 2' table – 160
16. Write the program to print nth Fibonacci number - 162

10 MARKS

1. Explain the formatted input with examples – 88
 - Inputting integer numbers
 - Inputting real numbers
 - Inputting character strings
 - Reading mixed data types
 - Detection of errors in input

2. Explain the IF statements. -112
 - Simple IF statement with flowchart
 - IF __ELSE statement with flowchart
 - NESTING IF__ELSE statements
3. Write the program for do while loop – 157
4. Write the program to print all prime number between 1 to n – 161
5. Write the program of nested for loops – 165
6. Draw the flowchart and write the program to build a pyramid – 167
7. Write the program to use of continue statement – 174

UNIT WISE QUESTIONS
PROGRAMMING IN C [I BSC IT]
UNIT III

2 MARKS [- with page numbers]

1. What is array? – 192
2. What are the types of array? – 193
3. What is static memory allocation? – 216
4. What are static arrays? – 216
5. What is Dynamic memory allocation? – 216
6. What are dynamic arrays? -216
7. Write the program for printing of the alphabet- 250
8. What is strcat() function? – 253
9. What is strcmp() function? – 254
10. What is strcpy() and strlen() function? – 255
11. Draw the diagram for Top-down modular programming – 271
12. What are the similarities between functions and variables in C? -274
13. What are the function definitions? – 274
14. What are the four parts of function declaration? – 260
15. Define Recursion – 285
16. What are the storage class of variables? - 302

5 MARKS

1. Describe One Dimensional Arrays with suitable program – 194
2. Describe Two Dimensional Arrays with suitable program – 203
3. Describe MultiDimensional Arrays with suitable program – 215
4. Write the program for scanf function – 239
5. Write the program for copying string and another? – 243
6. Write the program for string handling functions – 255
7. Write the program for passing arrays to a function – 298
8. Write the program to sorting of array elements using a function - 299

10 MARKS

1. Write the program to find the number of vowel and consonants – 245
2. Write the program for concatenation of strings – 252
3. Write the program to check if a string is palindrome or not – 257
4. Write the program to sorting of strings in alphabetical order – 260
5. Write the program for functions with no arguments and no return values – 282
6. Write the program for functions with arguments but no return values – 286
7. Write the program for functions with arguments and return values – 288

UNIT WISE QUESTIONS
PROGRAMMING IN C [I BSC IT]
UNIT IV

2 MARKS [- with page numbers]

1. What is the use of typedef keyword? – 327
2. Define the pointers – 357
3. Write the program of string handling by pointers - 373
4. What are the basic file operations of File management? -395
5. What are the simplest file I/O functions? - 398

5 MARKS

1. Write the program of comparing and copying structure variables – 332
2. Write the program for array of structure – 333
3. Write the program for accessing one dimensional array elements – 370
4. Write the program for passing of pointers as function parameters – 376
5. Write the program for pass the arguments using call by reference - 378

10 MARKS

1. Write the program of using structure as a function parameter
2. Write the short notes on pointers – 357
3. Write the program for pointer to structure variable – 382
4. Write the program for operations on integer data - 400
5. Write the program for error handling in file operations - 405

UNIT WISE QUESTIONS
PROGRAMMING IN C [I BSC IT]
UNIT V

2 MARKS [- with page numbers]

1. Define the Dynamic memory allocation -419
2. Define the memory allocation process with suitable diagram – 420
3. What are the memory allocation functions? – 420
4. What are the types of linked lists? – 428
5. What are the three situations to inserting a new item? – 435
6. Write the general algorithm for insertion? - 436
7. What are the three situations to delete an item? – 438
8. What are the three categories of directives? - 435

5 MARKS

1. Write the program for memory allocation with malloc - 421

10 MARKS

1. Write the program of reallocation and release of memory space – 425
2. Explain the pointers revisited – 429
 - Initialization
 - Assignment $p = q$
 - Assignment $*p = *q$
 - NULL pointers

ANNAI VAILANKANNI ARTS AND SCIENCE COLLEGE, THANJAVUR
DEPARTMENT OF INFORMATION TECHNOLOGY
UNIT WISE QUESTIONS - PROGRAMMING IN C [I BSC IT]
UNIT I

2 MARKS [with page numbers]

1. What is known as information? – 22
A programming language is designed to help process certain kinds of data consisting of numbers, characters and to provide useful output known as information.
2. What are tri-graph characters? How are they useful? – 22
ANSI C introduces the concept of tri-graph sequences to provide a way to enter certain characters that are not available on some keyboards.
3. What is program? -22
The task of processing of data is accomplished by executing a sequence of precise instructions called a program
4. What are the group of characters in C program? -22
 1. Letters
 2. Digits
 3. Special characters
 4. White spaces
5. What is known as C tokens? – 24
In a passage of text, individual words and punctuation marks are called tokens.
6. Write the rules for identifiers? – 25
Identifiers refer to the names of variable, functions and arrays
7. What are the three types of integers? – 25
There are three types of integers namely decimal integer, octal integer and hexadecimal integer
8. Write down the basic types of Constants? – 26
 1. Numeric constants
 2. Character constants
 3. Integer constants
 4. Real constants
 5. Single character constants
 6. String constants
9. Define the variables – 29
A variable is a data name that may be used to store a data value. Unlike constants that remain unchanged during the execution of a program, a variable may differ values at different times during execution.
10. What are the five main conditions for variable names? -29
 1. They must begin with a letter
 2. ANSI standard recognizes a length of 31 characters.
 3. Uppercase and lowercase are significant
 4. It should not be a keyword
 5. White space is not allowed
11. What are the three classes of data types? – 31
 1. Primary data types
 2. Derived data types
 3. User defined data types

12. Write the syntax for declaring a variable with example program- 33

Syntax

```
data-type v1,v2.....vn;
```

Example program

```
int count;
int number, total;
double ratio;
```

13. How you can use scanf function? Give an example code – 41

```
scanf(“%d”,&number);
```

Example program

```
main()
{
int number;
printf(“Enter an integer number”);
scanf(“%d”, &number);
}
```

14. What are the categories of Operators in C? – 52

- a. Arithmetic operators
- b. Relational operators
- c. Logical operators
- d. Assignment operators
- e. Increment and decrement operators
- f. Conditional operators
- g. Bitwise operators
- h. Special operators

15. Define the operator – 52

An operator is a symbol that tells the computer to perform certain mathematical or logical manipulations.

16. What are the rules for ++ and – operators? – 60

- a. They require variable as their operands
- b. When postfix ++ or – is used with a variable in an expression, that is evaluated first.
- c. When prefix is used , the variable is incremented or decremented

17. Define the Arithmetic expressions. – 63

An arithmetic expression is a combination of variables, constants, and operators arranged as per the syntax of the language.

18. Write the rules for Evaluation of expression. – 66

Rule 1. Parenthesized sub expression from left to right are evaluated

Rule 2. If parentheses are nested, the evaluation begins with the innermost sub expression

Rule 3. Arithmetic expressions are evaluated from left to right using the rules of precedence

19. Write an example C program for expression – 66

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
a=5<=8 && 61 -5;
printf(“%d”,a);
getch();
}
```

20. What is implicit type Conversion and Explicit Conversion? – 68 and 69

Implicit Type Conversion

C automatically converts any intermediate values to the proper type so that the expression can be evaluated without losing any significance. This automatic conversion is known as implicit type conversion.

Explicit Type Conversion

The process of local conversion is known as explicit conversion

UNIT II

2 MARKS [with page numbers]

1. Which function is used to read a single character? – 84
getchar() function is used to read a single character
2. Write the program for getchar() function? – 84
main()
{
char answer;
printf(“Would you like to know my name”);
printf(“Type Y for YES and N for NO”);
answer=getchar();
}
3. Write the program to test the character type? – 86
main()
{
char character;
printf(“Press any key”);
character = getchar();
if(isalpha(character)>0)
printf(“The character is a letter”);
else
printf(“The character is not alphanumeric”);
}
4. What is syntax for writing characters in C program? – 87
putchar(variable_name);
5. Write any four rules for scanf – 96
 - a. Each variable to be read must have a filled specification
 - b. For each field specification, there must be a variable address of proper type
 - c. Never end the format string with whitespace.
 - d. The scanf reads until an error is detected or the end of the file is reached
6. Write any five printf statements – 97
printf(“Programming in c”);
printf(“ ”);
printf(“\n”);
printf(“%d”, x);
printf(“\n\n”)
7. What are the decisions making statements? – 112
 - a. if statement
 - b. switch statement
 - c. conditional operator statement
 - d. goto statement

8. Write the general form of switch statement. – 127

```
switch(expression)
```

```
{
```

```
case value 1:
```

```
block 1
```

```
break;
```

```
case value 2:
```

```
block 2
```

```
break;
```

```
default:
```

```
default block
```

```
break;
```

```
}
```

9. What are the two categories of loops? – 153

a. Counter controlled loops

b. Sentinel controlled loops

UNIT III

2 MARKS [with page numbers]

1. What is array? – 192
Array is a fixed size sequenced collection of elements of the same data type
2. What are the types of array? – 193
 - a. One dimensional arrays
 - b. Two dimensional arrays
 - c. Multidimensional arrays
3. What is static memory allocation? – 216
The process of allocating memory at compile time is known as static memory allocation
4. What are static arrays? – 216
Arrays that receive static memory allocation are called static arrays
5. What is Dynamic memory allocation? – 216
The feature of allocating the memory to arrays at run time is known as dynamic memory allocation
6. What are dynamic arrays? -216
Arrays created at run time are called dynamic arrays.
7. Write the program for printing of the alphabet- 250

```
main()
{
char c;
printf("\n\n");
for(c=65; c<=122; c=c+1)
{
if(c>90 && c< 97)
continue;
printf("|%4d - %c",c,c);
}
printf("\n\n");
```
8. What is strcat() function? – 253
The strcat function joins two strings together
9. What is strcmp() function? – 254
The strcmp function compares two strings identified by the arguments and has a value 0.
10. What is strcpy() and strlen() function? – 255
This function works almost like a string assignment operator
11. What are the similarities between functions and variables in C? -274
 - a. Both function names and variable names are considered identifiers and therefore they must adhere to the rules for identifiers
 - b. Like variables, functions have types associated with them
 - c. Like variables, functions names and their types must be declared and defined before they are used in the program
12. What are the function definitions? – 274
 - a. function name
 - b. function type
 - c. list of parameters
 - d. local variable declarations
 - e. functions statements
 - f. return statement

13. What are the four parts of function declaration? – 280

- a. function type
- b. function name
- c. parameter list
- d. terminating semicolon

14. Define Recursion – 295

Recursion is a special case of the process where a function calls itself

15. What are the storage class of variables? – 302

- a. Automatic variables
- b. External variables
- c. Static variables
- d. Register variables

UNIT IV

2 MARKS [with page numbers]

1. What is the use of typedef keyword? – 327
We can use the keyword typedef to define a structure
2. Define the pointers – 357
 - a. Pointers are more efficient in handling arrays and data tables
 - b. Pointers can be used to return multiple values from a function via function arguments
3. What are the basic file operations of File management? -395
 - a. naming a file
 - b. opening a file
 - c. reading data from a file
 - d. writing data to a file
 - e. closing a file
4. What are the simplest file I/O functions? – 398
The simplest file I/O functions are getc and putc.

UNIT V

2 MARKS [with page numbers]

1. Define the Dynamic memory allocation -419
The process of allocating memory at run time is known as dynamic memory allocation
2. Define the memory allocation process with suitable diagram – 420

Local variables
Free memory
Global variables
C program instructions

3. What are the memory allocation functions? – 420
 - a. malloc
 - b. calloc
 - c. free
 - d. realloc
4. What are the types of linked lists? – 428
 - a. Circular linked lists
 - b. Two way or doubly linked lists
 - c. Circular doubly linked lists
5. What are the three situations to inserting a new item? – 435
 - a. insertion at the front of list
 - b. insertion in the middle of the list
 - c. insertion at the end of the list

6. Write the general algorithm for insertion? – 436

Begin

if the list is empty or
the new node comes before the head node then,
insert the new node as the head node,

else

if the new node comes after the last node, then
insert the new node as the end node,

else

insert the new node in the body of the list

7. What are the three situations to delete an item? – 438

a. Deleting the first item

b. Deleting the last item

c. Deleting between two nodes in the middle of the list