SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
COIMBATORE – 35
DEPARTMENT OF COMPUTER SIENCE AND ENGINEERING (UG & PG)
First Year & 1st Semester
2 Marks Question and Answer

Subject Code & Name: 19CST101 – Programming for Problem Solving

UNIT V

1. What is meant by Preprocessor?

Preprocessor is the program, that process our source program before the compilation

2.What are the pre-processor directives?

- Macro Inclusion
- Conditional Inclusion
- File Inclusion

3.Compare arrays and structures.

Arrays	Structures
An array is a collection of data items ofsame data type.	A structure is a collection of data items of different data types.
Arrays can only be declared.	Structures can be declared and defined.
There is no keyword for arrays.	The deyword for structures is struct.
An array name represents the address ofthe starting element.	A structrure name is known as tag. It is a shorthand notation of the declaration.
An array cannot have bit fields.	A structure may contain bit fields.

4. **Compare structures and unions.**

Union	Structures
All members use the same memory.	Every member has its own memory.
The keyword used is union.	The keyword used is struct.
Different interpretations for the same memory location are possible.	All members occupy separate memory location, hence different interpretations of the same memory location are not possible.
Conservation of memory is possible	Consumes more space compared to union.

5. Is it better to use a macro or a function?

Macros are more efficient (and faster) than function, because their corresponding code is Inserted directly at the point where the macro is called. There is no overhead involved in using a macro like there is in placing a call to a function.However, macros are generally small and cannot handle large, complex coding constructs. In cases where large, complex constructs are to handled, functions are moresuited, additionally; macros are expanded inline, which means that the code is replicated foreach occurrence of a macro.

6. **Define Union. Explain Union in detail.**

Union is a collection of variables similar to structure. The union requires bytes that are equal to number of bytes required for the largest number.

Example:

```
union student
{
char name[20];
int rollno,m1,m2,m3,tot;
float avg;
}s1;
```

Union of structure

Union can be nested with another union.

7. Define Structures. Explain structures in detail. (JAN 2009 / MAY2009)

A structure is a collection of one or more variables of different data types grouped together under a single name. It contains different data types.

Syntax:

```
{
    type variable 1;
    type variable 2;
    type variable n;
} structure_variables;
```

Example:

```
struct student
{
    char name[25];
    int rollno;
    int m1,m2,m3,total;
    float avg;
}s1,s2;
```
- Structure within structure
- Array of structures
- Pointers to structures
- Structures and functions

8. Describe in detail about the Preprocessors in C.

The define statement is used to make programs more readable, and allow the inclusion of macros. Consider the following examples,

```
#define TRUE 1 /* Do not use a semi-colon , # must be first character on line */
#define FALSE 0
#define NULL 0
#define AND &
#define OR |#define EQUALS ==
game_over = TRUE;
while( list_pointer != NULL )
```

9.What are pointers? When and why they are used? Explain in detail with sample programs.

Pointer variable is needed to store the memory address of any variable. Denoted by(*) asterisk.

Pointer Declaration:

Syntax:

```
datatype *variable-name;
```

Example:

```
int *a;
```

10. Declare the C structures for the following scenario:

(i) College contains the following fields: College code (2characters), College Name, year of establishment, number of courses.
(ii) Each course is associated with course name (String), duration, number of students.
(A College can offer 1 to 50 such courses)

(i). Structure definition for college :-

```
struct college
{
char code[2];
char college_name[20];
int year;
int no_of_courses;
};

//Variable declaration for structure college :-
void main( )
{
struct college col1,col2,col3;
….
}
```

(ii). Structure definition for course :-

```
struct course
{
char course_name[20];
float duration;
int no_of_students;
};
// Variable declaration for structure course :-
void main( )
{
struct course c1,c2,c3;
….
}
```

11. How to access the data for structure variables using member operator(„.")?Explain with an example.

The members of a structure can be accessed by using dot(.) operator.
Structures use a dot (.) operator(also called period operator or member operator) to refer its elements. Before dot, there must always be a structure variable. After the dot, there must always be a structure element.

The **syntax** to access the structure members as follows,

structure_variable_name **.** structure_member_name

12. What is structure within structure? Give an example for it.(or) Write a C program to illustrate the concept of structure within structure(or) Explain about nested structures.

Nested Structure (Structure within structure)

A structure which includes another structure is called nested structure or structure within structure. i.e a structure can be used as a member of another structure. There are two methods for declaration of nested structures.

(i) The syntax for the nesting of the structure is as follows

```
struct tag_name1
{
type1 member1;
…….
…….
};
struct tag_name2
{
type1 member1;
……
……
struct tag_name1 var;
……
};
```

The syntax for accessing members of a nested structure as follows,

outer_structure_variable . inner_structure_variable **. member_name**