**Variable Scope and Storage Specifier Assignments**

Mandatory

1. Refer the code snippet below and answer the queries

int val;

extern void display();

static int function()

{

val++;

int x = 10;

int i = 0;

static int j = 20;

for (; i < 3; i++)

{

int x = 20;

printf(“\n %d”, x+i);

x+=3;

j++;

display();

}

return val;

}

int main(int argc, char \*argv[])

{

val= 0;

function();

return 0;

}

**a. What is the change required if val declaration line below is to be moved to an other file?**

Ans: **Change required if**val**declaration is moved to another file**

Move the declaration of int val; to another file, you need to declare it as extern in the current file to inform the compiler that the variable is defined elsewhere.

extern int val; in the file where function() and main() are defined.

**b. What is the value of x after for loop execution?**

Ans: The variable x declared inside the for loop is local to the loop and shadows the x declared at the beginning of the function. After the loop, the value of x declared inside the loop is not accessible. The x declared at the beginning of the function remains unchanged at 10.

**c. What does the keyword static in following lines mean?**

static int function()

static int j = 20;

Ans:

* static int function(): The static keyword here means that the function function() has internal linkage, meaning it is only visible within the file it is declared in.
* static int j = 20; : The static keyword here means that the variable j retains its value between function calls and is initialized only once.

**d. What is the value of j after for loop execution?**

Ans: The variable j is incremented in each iteration of the loop. Since the loop runs 3 times, j will be incremented from 20 to 23.

**e. Identify the variables which would be in the stack of function()**

Ans: The variables that would be in the stack of function() are:

* x (the one declared at the beginning of the function)
* i (loop counter)
* x (the one declared inside the for loop)

**f. What does extern in the following line mean?**

**extern void display();**

Ans: The extern keyword in extern void display(); indicates that the function display() is defined in another file. the compiler that the function exists and will be linked during the linking phase.