

Department of Computer Science and Engineering
Bangladesh University of Engineering and Technology
CSE210: Object-Oriented Programming Language
Class Test-1, Marks-20, Time-20 Minutes

Q. Write a C++ program to define and test the functions of the following class. Do not use any “cstring” or “string” library function.

```
class SafeString {
    char *str;
public:
    SafeString(char *s) ; //Constructor safely copies string s into string str
    /* Destructor releases the allocated memory of str when a SafeString object goes out of scope */
    ~SafeString() ;
    int length(char *s); //Returns the length of the string s
    bool equals(char *s); //Boolean function returns true if strings str and s are same
    void concatenates(char *s); //Safely concatenates s at the end of str
};
```

Answer:

```
#include <iostream>
using namespace std;
```

```
class SafeString {
    char *str;
public:
    SafeString(char *s) ; //Constructor safely copies string s into string str
    /* Destructor releases the allocated memory of str when a SafeString object goes out of scope */
    ~SafeString() ;
    int length(char *s); //Returns the length of the string s
    bool equals(char *s); //Boolean function returns true if strings str and s are same
    void concatenates(char *s); //Safely concatenates s at the end of str
    char *getstr();
};
```

```
SafeString::SafeString(char *s){
    int i, l;
    l=length(s);
    str=new char[l+1];
    for(i=0;s[i];i++){
        str[i]=s[i];
    }
    str[i]='\0';
}
```

```
SafeString::~~SafeString(){
    delete []str;
}
```

```
char *SafeString::getstr(){
    return str;
}
```

```
int SafeString::length(char *s){
    int l=0;
    for(l=0;s[l];l++);
    return l;
}
```

```
bool SafeString::equals(char *s){
    int l1, l2,i;
    l1=length(str);
```

```

        l2=length(s);
        if(l1!=l2){
            return false;
        }
        else{
            for(i=0;i<l1;i++){
                if(str[i]!=s[i]){
                    return false;
                }
            }
            return true;
        }
    }
}

void SafeString::concatenates(char *s){
    int l1, l2, i,j;
    l1=length(str);
    l2=length(s);
    char *temp=new char[l1+l2+1];
    for(i=0;str[i];i++){
        temp[i]=str[i];
    }
    for(j=0;s[j];i++, j++){
        temp[i]=s[j];
    }
    temp[i]='\0';
    delete []str;
    str=temp;
}

int main(){
    char str1[80]="I love C++";
    char str2[80]="I love Bangladesh";
    char str3[80]="I love C++";
    SafeString s(str1);
    cout<<s.getstr()<<endl;
    if(s.equals(str3)){
        cout<<"s.str is equal to str3"<<endl;
    }
    if(s.equals(str2)){
        cout<<"s.str is equal to str2"<<endl;
    }
    s.concatenates(str2);
    cout<<s.getstr()<<endl;

    return 0;
}

```