

National University of Computer and Emerging Sciences, Lahore Campus



Course: Computer Programming Course Code: CS103
Program: BS(Computer Science) Semester: Spring 2018 Duration: 60 Minutes Total
Marks: 30

Paper Date: 26-Feb-2018 Weight 15
Section: All Page(s): 5

Exam: Midterm-I Roll No:

Instruction/Notes: You can take extra sheets for rough work but not attach with this paper.

Question 1 (5 marks) Write the output of the following code segment:

```
void doSomething(int **p, int size){  
    *p = new int[size];  
    for (int i = 0; i < size; i++)  
        (*p)[i] = i + size;  
  
    for (int i = 0; i < size; i++)  
        cout<< (*p)[i] << " ";  
    cout << endl;  
}
```

```
int main(){  
    int rows = 3;  
    int ** a = new int *[rows];  
  
    for (int i = 0; i < rows; i++)  
        doSomething(&a[i], rows+i);  
  
    for (int i = 0; i < rows; i++)  
        delete[] a[i];  
    delete[] a;  
    return 0;  
}
```

Answer:

Question 2 (Sections A, F and G ONLY) (10 marks) Given a dynamic array of pointers to dynamically allocated Student objects provide implementation for a **deallocate** function (with the prototype given below) to delete all students and the array containing the pointers. Also note that the name inside each student is also a dynamically allocated array and must be deleted.

```
struct Student {  
    char * name;  
    int rollNumber;  
};
```

```
void deallocate(Student** stds, int size);
```

Question 2 (Sections B, C, D and E ONLY) (5+5 marks)

<pre>int main(){ char ** mypets = new char*[2]; char * Cat = new char[30]; char * Dog = new char[30]; strcpy(Cat, "Milo a Furry Cat\n"); strcpy(Dog, "Courage a Brave Dog \n"); mypets[0] = Cat; mypets[1] = Dog; delete[] Cat; for (int i = 0; i < 2; i++) cout << mypets[i] << endl; delete[] mypets; mypets = nullptr; } cout << endl; } } return 0; }</pre>	Output/Error:
<pre>void main(){ int ** arr = new int*[3]; int ** arr2 = new int*[3]; for (int i = 0; i < 3; i++){ arr[i] = nullptr; arr2[i] = nullptr; } arr[0] = new int(50); // arr[0] is pointing to an int and int is initialized to 50 arr[1] = new int(60); arr2[1] = new int(40); arr2[2] = arr[1]; for (int i = 0; i < 3; i++){ if (arr[i] != nullptr) cout<< *arr[i] <<" "; } cout << endl; for (int i = 0; i < 3; i++){ if (arr2[i] != nullptr) cout << *arr2[i] << " "; } for (int i = 0; i < 3; i++){ delete arr[i]; delete arr2[i]; } delete[] arr; delete[] arr2; arr = nullptr; arr2 = nullptr; }</pre>	Output/Error:

Question 3: (15 marks) Write C++ code for a function that takes a 2d-dynamic array of words as input and removes all repetitions of the same words. Make sure that there are no memory leaks in your program, and the new 2d-array should contain exactly the amount of space required to store the unique words. You cannot use built in string functions.

Following is an example:

Input array before function call After function call

Good		Good
Myth		Myth
Why		Why
Good		Psych
Psych		
Myth		

