**National University of Computer & Emerging Sciences, Karachi** **Fall-2019 (CS-Department)  
Quiz 2**

|  |  |  |
| --- | --- | --- |
| **Course Code:** CS-217 | **Course Name:** Object-oriented Programming | |
| **Student ID:** | | **Section:** |
| **Date:** October 1, 2019 | | **Time:** 20 minutes |

**Question 1:**

a) Briefly write the purpose of mutable variables.  
b) Can we save reference to a constant variable in a constant pointer? (Yes/No)  
c) Is a class with only static members really useful at all? (provide a brief but reasonable answer)

**Answer:**

a) A variable declared as mutable can have its value changed in a constant function.

b) Yes

c Declaring a class with only static members imply that any instance of that class won't be able to  
 use those members, hence a class with only static members go against the principles of OOP and is least useful.

**Question 2:**

MajinBuu Package Delivery Service wants you to write a test version of an application for them. Whenever a package is ready for delivery, it is first sent to the Dispatch Department, which in turn forwards that package for delivery based on the receiver's Tracking ID (format: TMP-xxx), NIC# & Contact Number (format: +923xxxxxxxxx). Packages without any Tracking ID are sent back to the Vendors. Since this is a test system, your application must only allow four (4) packages in all.

**Answer:**

class Package  
{  
 string trackingID;  
 static int pkgCount;  
 public:  
 Package(string trackingID = " ") { this-> trackingID = trackingID; pkgCount++; }  
};  
int Package::pkgCount = 0;  
  
class Dispatch\_Dept  
{  
 public:  
 void dispatch(Package pkg, Receiver r)  
 {  
 int count = Package::pkgCount;  
 if(pkg.trackingID == " " && count < 4)  
 cout << "Package returned" << endl;  
 else  
 send(pkg, r);   
 }  
   
 void send(Package pkg, Receiver r)  
 {  
 cout << "Package " << pkg.trackingID << " sent to " << r.NIC << endl;  
 }  
};

class Receiver  
{  
 string NIC;  
 string contactNo;  
 public:  
 Receiver(string n, string c) { NIC = n; contactNo = c; }  
};

int main()  
{  
 Package p1("TMP-111");  
 Receiver r1("42301-1001010-0", "+923317777777");  
 Dispatch\_Dept d;

d.dispatch(p1, r1);  
}