Cairo University	**Cairo University – Faculty of Graduate Studies for Statistical Research**			
	Department: Computer sciences			
	Academic Year: 1	**Semester:** 2		
	Date: 23-6-2019	**Level:** Diploma		
Course Title: Computer Programming (1)	**Course code:** CS503	**Time:** 3 Hours	**Exam marks:** 75	**Exam Sheets:** 3

Question one: Choose the correct output of each of the following: (10 Marks)

1) #include <iostream> using namespace std; int gcd (int m, int n) **{** if (n == 0) return m; else return gcd (n, m % n); **}** int **main**() { cout << gcd (4,8) <<endl; return 0; }	**a)** 2	**b)** 4	**c)** 8	**d)** none of the above.
2) #include <iostream> using namespace std; void fun1 (int a, int b) **{** if (b >= a) return ; cout << b << endl; fun1 (a, b*2); **}** int **main**() { fun1 (9,1); return 0; }	**a)** 1 3 5 7 9	**b)** 1 2 4 6 8	**c)** 1 2 4 8	**d)** none of the above.

Question two: What is the output of each of the following: (15 Marks)

1) #include <iostream>
using namespace std;
int **main**() {
double a = 37.2;
double *ptr = &a;
*ptr = 58.8;
cout << &ptr << endl;
cout << ptr << endl;
cout << a << endl; return 0; }	

2) #include <iostream>
using namespace std;
void fun1 (int& a) **{**
a *= 5;
cout << a << endl; **}**
int **main**() {
int b = 1;
fun1 (b);
cout << endl;
cout << b << endl; return 0; }	

3) #include <iostream>
using namespace std;
void fun1 () **{**
int b = 10;
static int a = 1;
a *= 2;
b *= 6;
cout << " a = " << a << " and b = " << b << endl; **}**
int **main**() {
fun1 ();
cout << endl<< "/////" <<endl;
fun1 (); return 0; }	

Question three: What should be corrected in each of the following: (10 Marks)

1) #include <iostream> using namespace std
int main() {
double a = 2.2; b = 2.2;
cout << pow(a, b) << endl;
return 0; }	

2) int n[10] = {2, 4, 6, , 10};	

3) class t{
int sum();
int t();
int t(int x, int y);
int a=1;
int b=1;
}	

Question four: Write an enhanced version to each of the following: (5 Marks)

1) double f (double a, double b){
double temp;
if (a >= b) temp = a;
else temp = b;
return temp; }	

2) #include <iostream>
using namespace std;
char grade (int score) {
switch (score / 10) {
case 0:
case 1:
case 2:
case 3:
case 4:
case 5:
return 'F'; break;
case 6:
return 'D'; break;
case 7:
return 'C'; break;
case 8:
return 'B'; break;
case 9:
case 10:
return 'A'; break; } }
int main() { cout<<grade (70)<<endl; return 0;}	

Question five: Write the required code to achieve each of the following: (10 Marks)

1) Initialize the pointer mypointer so that it points to nothing.	
2) De-allocate the dynamic variable p.	
3) Make the pointers ptr1 and ptr2 point to the same memory location.	
4) Convert the following function into void function: double area (double l, double w) {return l * w; }	

Question six: (25 Marks)

1) For a company that has many workers, do the following:

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a) Define a worker's record wor-rec that contains these characteristics:

Name
ID
Number of worked hours
Wage
Gender

b) Write the definition of a function that displays the contents of a variable of type wor-rec

c) Write the declaration of the previous function.

d) Declare an array arr of 20 elements of type wor-rec.

e) Write two equivalent codes to assign the value of the variable var1 to the variable var2.
(var1 and var2 are of type wor-rec.)

f) If this company gives a degree every year to every worker to differentiate between its workers in the last 10 years, what you have to change in your answer for question number a.

2) Write the definition of a function that inputs the elements of the integer one-dimensional array arr from the user.

Best Wishes, Nadia Abd-Alsabour