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**Groupe : .............…………………………………………………………………………...**

**3IIR : Examen POO**

**Exercice 1 :**

Indiquez, en **argumentant,** ce qu’affichera le programme suivant :

#include <iostream>

#include <string>

using namespace std;

class P {

public:

P() { cout << "P" << endl; }

P(int i) { cout << "P(" << i << ")" << endl; }

virtual ~P() { cout << "~P" << endl; }

virtual string coucou() { return "coucou"; }

};

class S : public P {

public:

S() { cout << "S" << endl; }

~S() { cout << "~S" << endl; }

string coucou() override { return "cuicui"; }

};

void f(P p) { cout << "bonjour" << endl; }

void f(P\* p) { cout << p->coucou() << endl; }

int main()

{

P p;

S\* s = new S;

S\* ps = s;

P\* pp = ps;

f(p);

f(s);

f(pp);

f(ps);

delete s;

return 0;

}

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**Exercice 2 :**

**Compilez** puis **expliquez** en justifiant, quel résultat donnera le code source suivant :

#include<iostream>

using namespace std;

class **Banque**

{

**public**:

virtual void calculer()=0 ;

void show() { cout<<" Dans Banque " << endl; }

};

class **BanqueNum**: public Banque

{

int i;

public:

void show() { cout<<" BanqueNum " << endl; }

};

int main()

{

Banque \*bp = new BanqueNum;

bp->show();

Banque &br = \*bp;

br.show();

return 0;

}

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**Exercice 3 :**

* Soit un magasin qui commercialise des articles. Un article est identifié par un code (int) (***le code doit être unique pour chaque article***) et caractérisé par une désignation (string) et un prix (double).
* Pour chaque article, on souhaite connaitre le prix de transport. Celui-ci est égal à 5 % du prix de l'article.

1. Définir la classe **Article** avec :
   1. Ses données membres,
   2. Un constructeur avec paramètres,
   3. Une fonction "**prixTransport**" pour retourner le prix du transport d'un article.

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* Pour les **articles fragiles**, le magasin les emballe dans des emballages spécifiques avant de les transporter. On souhaite connaitre pour chaque article fragile, le type d'emballage (string) utilisé (carton, plastique, …)

1. Définir la classe **A\_Fragile** avec :
   1. Ses données membres,
   2. Un constructeur avec paramètres,
   3. Une fonction pour retourner le prix du transport d'un article fragile.
      * Le prix de transport d’un article fragile est deux fois le prix de transport d'un article normal.

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1. On souhaite connaitre le prix de transport d'un article quel que soit son type (normal ou fragile)
   1. Quel mot clé doit-on utiliser ? Ajoutez ce mot clé là où c'est nécessaire de le mettre.

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1. On souhaite pouvoir afficher les informations d'un article A quel que soit son type (normal ou fragile) à l'aide de cette expression **cout << A ;**
   1. Proposer une solution pour atteindre cet objectif.

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