Programming in C++: Examination Paper Set-1

Total Marks : 80

August 15, 2017

I Objective – From Slides (16 Questions of 1 mark each)

Question 1

What will be the output of the following program? **MCQ**
Mark 1

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

int main() {

    typedef struct Complex {
        double re;
        double im;
   } Complex;

   const Complex c = {2,4} ;

   c.re = 5.9;
   cout << c.re;

   return 0;
}
```

a) 5.9

b) Cannot assign an integer value to a double variable

c) 5.90

d) Cannot assign value 5.9 to c.re as it is read-only

Answer: d)

Question 2

Identify a ternary operator in C++? **MCQ**
Mark 1

a) ?:

b) &&

c) *=

d) <<

Answer: a)

Question 3

Which value will be printed for `data.c`? **MCQ**

Mark 1

```
#include <stdio.h>
#include <string.h>

int main() {
    union Data {
        int i;
        unsigned char c;
    } data;

    data.c ='C';
    data.i = 97; // ASCII code of 'a' is 97
    printf( "%c\n", data.c);

    return 0;
}
```

a) 97

b) a

c) C

d) C 97

Answer: b)

Question 4

Consider the code snippet below.

```
int * const p = &n;
```

Which of the following statement is true for the variable '`p`'? **MCQ**
Mark 1

a) non-const-Pointer to const-Pointee

b) const-Pointer to const-Pointee

c) const-Pointer to non-const-Pointee

d) non-const-Pointer to non-const-Pointee

Answer: c)

Question 5

Consider the following code segment and identify the statement which is error free. **MCQ**
Mark 1

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

int main() {
    int m = 4;
    const int n = 5;
    const int * p = &n;
    int * const q = &m;

    n = 6;   // stmt-1
    *p = 7;  // stmt-2
    *p = &m; // stmt-3
    *q = 8;  // stmt-4

    return 0;
}
```

a) stmt-1

b) stmt-2

c) stmt-3

d) stmt-4

Answer: d)

Question 6

Consider Object `S` of class `Sample`. What is the type of `this` pointer to `S`? **MCQ**
Mark 1

a) `S * const`

b) `S const * const`

c) `S *`

d) `const S const *`

Answer: a)

Question 7

Consider a class `Test`. Identify the permissible signatures of a Copy Constructor below. **MCQ**

Mark 1

a) `Test(const Test t), Test(Test t);`

b) `Test(const Test* t), Test(Test* t);`

c) `Test(Test& t), Test(Test* t);`

d) `Test(const Test& t), Test(Test& t);`

Answer: d)

Question 8

What is the output of the following program? **MCQ**

Mark 1

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

// compare Function Pointer
bool compare (int i, int j) {
    return (i < j);
}

int main() {
    int data[] = {16, 12, 17, 56, 54, 32, 43, 62};

    sort (data, data+4, compare);

    for (int i = 0; i < 5; i++)
        cout << data[i] << " ";

    return 0;
}
```

a) 12 16 17 54 56 32 43 62

b) 12 16 17 32 43 54 56 62

c) 12 16 17 54 56

d) 12 16 17 56 54

Answer: d)

Question 9

What will be the output of the following program? **MCQ**
Mark 1

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

class Base { public:
    Base()  { cout << "Base Ctor" << endl; }
    ~Base() { cout << "Base Dtor"<< endl; }
};

class Derived: public Base { public:
    Derived()  { cout << "Derived Ctor" << endl; }
    ~Derived() { cout << "Derived Dtor" << endl; }
};

int main() {
   Derived d1; {
      Base b1;
   }
   return 0;
}
```

a) Base Ctor
   Derived Ctor
   Base Ctor
   Base Dtor
   Base Dtor
   Derived Dtor

b) Derived Ctor
   Base Ctor
   Base Ctor
   Base Dtor
   Derived Dtor
   Base Dtor

c) Derived Ctor
   Base Ctor
   Base Dtor
   Derived Dtor

d) Base Ctor
   Derived Ctor
   Base Ctor
   Base Dtor
   Derived Dtor
   Base Dtor

Answer: d)

Question 10

What is the output of the following program? **MCQ**
Mark 1

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

class Department { public:

    string dept;
    Department(string d):dept(d) { }

    void getDeptName() { cout << dept;}
};

class Student : private Department {
public:
    string name;

    Student(string n = "Mechanical", string d = "Electrical") :
                                        name(n), Department(d) { }

    using Department::getDeptName;
};

int main() {

    Student s ("Civil");
    s.getDeptName();

    return 0;
}
```

a) `Civil`

b) `Mechanical`

c) `Electrical`

d) Compilation Error: `getDeptName()` cannot be accessed

Answer: c)

Question 11

Which of the following statement is true about the following program? **MCQ**
Mark 1

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

class B {
public:
    int base;
    B() {}
    ~B() {}
};

class D: public B {
public:
    int derived;
    D() {}
    ~D() {}
};

int main() {
    D d1; D d2;
    cout << &d1.base << " ";
    cout << &d2.base ;

    return 0;
}
```

a) Compilation Error: A reference base object should be created before accessing

b) Compilation error: Data member `base` cannot be accessed using derived class object.

c) Two `cout`'s will give different Address location

d) Both `cout` will give same Address location

Answer: c)

Question 12

What will be the output of the following program? **MCQ**
Mark 1

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

int main(){
    int *t, *s;
    const int y = 3;
    t = const_cast<int *>(&y);

    s = t ;
    *t  = 4 ;
    cout << y << " " << *t << " " << *s << endl;

    return 0;
}
```

a) Compilation Error: Invalid Conversion of Pointers

b) Compilation Error: Invalid use of Cast operator

c) 3 4 4

d) 3 3 4

Answer: c)

Question 13

What will be the output of the following program? **MCQ**
Mark 1

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

class Base {
public:
    int var_;
};

class Derived: private Base {
public:
    int varD_;
    void print() { var_ = 2; cout << var_; }
};

int main() {
   Derived d;
   d.print();

   return 0;
}
```

a) Compilation Error: `var_` cannot be accessed in class `Derived`

b) Compilation Error: `var_` cannot be accessed in `main`

c) Compilation Error: `Base` object should be created first for inheritance

d) 2

Answer: d)

Question 14

Consider the code snippet below. What will be the symbolic expression that `a->d('s');` compiles to? **MCQ**

Mark 1

```
class A { public:
    virtual void f(int) { }
    virtual void g(double) { }
    virtual void d(char) { }
    int h(A *) { }
};

class B: public A { public:
    void f(int) { }
    virtual int h(B *) { }
};

class C: public B { public:
    void g(double) { }
    void d(char) { }
    int h(B *) { }

};

A *a = 0;

a->d('s');
```

a) `a->vft[2](a, 's');`

b) `a->vft[1](a, 's');`

c) `Error`

d) `C::d(a, 's');`

Answer: a)

Question 15

What will be the output of the following code? **MCQ**
Mark 1

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

int main(){
    try {
        try  {
            throw 78.9;
        }
        catch (int n) {
            cout << "Locally Handle " << '\n';
            throw;
        }
    }
    catch (int n) {
        cout << "Handle in the outer loop " << '\n';
    }
    catch(...) {
        cout << "default";
        return 0;
    }

    return 0;
}
```

a)
```
Locally Handle
Handle in the outer loop
```

b)
```
Locally Handle
Handle in the outer loop
default
```

c)
```
Locally Handle
default
```

d)
```
default
```

Answer: d)

Question 16

Consider the code snippet below and choose the correct syntax to use the stack template as a stack of `char`. **MCQ**

Mark 1

```
template<class T>
class Stack {
    T data_[100];
    int top_;
public:
    Stack();
    ~Stack();
    void push(const T& item);
    void pop();
    const T& top() const;
    bool empty() const;
};
```

a) `Stack<char> s;`

b) `Stack s<char>;`

c) `Stack char s;`

d) `Stack char = s;`

Answer: a)

II Assignment (16 Questions of 2 marks each)

Question 1

What is the output of the program below? **MCQ**
Marks 2

```
#include <stdio.h>

int main() {

    int i_ = 2, *j_, k_;

    j_ = &i_;

    printf("%d\n", i_**j_*i_+*j_);

    return 0;
}
```

a) Compilation Error: Erroneous syntax

b) 16

c) 10

d) 8

Answer: c)

Question 2

Fill in the blank to concatenate strings `str1` and `str2` to form `str3`? **MSQ**

Marks 2

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

int main(void) {
    string str1 = "I Love to ";
    string str2 = "Cycle";

    string str3 = ________________________;
    cout << str3;
    return 0;
}
```

```
Output: I Love to Cycle
```

a) `str1+str2`

b) `strcat(str1,str2)`

c) `str1.append(str2)`

d) `strcat(strcpy(str3,str1),str2)`

Answer: a), c)

Question 3

Following is a program for post-fix evaluation. Fill in the blanks marked by `S1#` and `S2#` to generate the output: `21`. **MCQ**

Marks 2

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

int main() {
    char postfix[] = { '5', '4', '4', '*', '+' }, ch;
    stack<int> s;

    for (int i = 0; i < sizeof(postfix)/sizeof(char); i++) {
        ch = postfix[i];

        if (isdigit(ch)) { s.push(ch - '0'); }
        else {
            int op1 = _________________; // S1#
            int op2 = _________________; // S2#

            switch (ch) {
                case '*': s.push(op2 * op1); break;
                case '+': s.push(op2 + op1); break;
            }
        }
    }
    cout << s.top();

    return 0;
}
```

a) `S1#: s.pop(); s.top(); S2#: s.top(); s.pop();`

b) `S1#: s.top(); s.pop(); S2#: s.pop(); s.top();`

c) `S1#: s.top(); s.pop(); S2#: s.top(); s.pop();`

d) `S1#: s.top(); s.top(); S2#: s.pop(); s.pop();`

Answer: c)

Question 4

Identify the correct statement associated with the program given below. **MCQ**
Marks 2

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

#define TWO 2
#define PI 4.0*atan(1.0)

int main() {
    int r = 10;
    double peri = TWO * PI * r;

    cout << "Perimeter = " << peri << endl;

    return 0;
}
```

a) Type of PI may be indeterminate

b) PI is a variable

c) PI can be changed in the program

d) TWO is not a manifest constant

Answer: a)

Question 5

What will be the output of the following code? **MCQ**

Marks 2

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

double increment(const double &prm) {
    return (prm + 1);
}

int main() {
    double x = 10, y;
    y = increment(x);

    cout << x+2 << " " << y;

    return 0;
}
```

a) 13 11

b) 10 11

c) 11 11

d) 12 11

Answer: d)

Question 6

What will be the output of the following code? **MCQ**
Marks 2

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

inline int SQR(int x) { return x * x; }

int main() {
    int a , b, c;
    a = 10, b = 14;

    b = SQR(a);
    cout << b << " ";

    c = SQR(++a);
    cout << c << endl;

    return 0;
}
```

a) 100 121

b) Compilation Error: invalid function definition

c) 100 132

d) Compilation Error: invalid function parameter

Answer: a)

Question 7

Fill up the blanks to get the output: `I love Travelling` **MCQ**

Marks 2

```
#include <iostream>
#include <string>
#include <cstring>
#include <cstdlib>
using namespace std;

typedef struct _String { char *str; } String;

___________________________________ {

    String s;
    s.str = (char *) malloc(strlen(s1.str) + strlen(s2.str) + 1);
    strcpy(s.str, s1.str);
    strcat(s.str, s2.str);

    return s;
}

int main() {
    String s1, s2, s3;

    s1.str = strdup("I");
    s2.str = strdup(" love Travelling ");
    s3 = s1 + s2;

    cout << s3.str << endl;

    return 0;
}
```

a) `String operator+(const String& s1, const String& s2)`

b) `string operator+(const String& s1, const String& s2)`

c) `String +(const String& s1, const String& s2)`

d) `String operator+(const String* s1, const String* s2)`

Answer: a)

Question 8

Consider the program below. An implementation of class `Test` is shown along with an application section using objects of class `Test`. **MCQ**

Marks 2

```
PROGRAM 1    // Implementation of class Test
#include<iostream>
using namespace std;
class Test {
    int x_, y_;
public:
    void print() { cout << x_ << " " << y_; }
    void setx(int m_) { x_ = m_;}
    void sety(int n_) { y_ = n_;}
    int calc1(int n_) {
        int t = n_ * x_ * y_;
        x_ = n_ * 3;
        return t;
    }
    void calc2(int n_) {
        int t = n_ * x_;
        cout << t;
    }
};

int main() {  // Application section
    Test t;
    t.setx(5);

    return 0;
}
```

Now we make some changes to the class as given below.

```
PROGRAM 2    // Updated Implementation of class Test
#include<iostream>
using namespace std;
class Test {
    int x_[2], y_;
public:
    void print() { cout << x_[0] << " " << y_; }
    void setx(int m_) { x_[0] = m_; x_[1] = 0; }
    void sety(int n_) { y_ = n_; }
    int calc1(int n_) {
        int t = n_ * x_[0] * y_;
        x_[0] = n_ * 3;
        return t;
    }
    void calc2(int n_) {
        int t = n_ * x_[0];
        cout << t;
    }
};
```

What changes would be required in the application section (`main()` function?

a) Create different objects

b) Pass different parameters to the `setx()` and `sety()` function

c) No change required

d) Pass different parameters to the `calc1()` and `calc2()` function

Answer: c)

Question 9

Fill in the blanks to get the output: `7 3` . **MCQ**
Marks 2

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

class sample {
public:
    int x, y;
    sample() {};
    sample(int, int);
    sample operator + (sample);
};
sample::sample (int a, int b) {
    x = a;
    y = b;
}
---------------------------- {
    sample temp;
    temp.x = x + param.x;
    temp.y = y + param.y;

    return (temp);
}
int main () {
    sample a (4,1);
    sample b (3,2);
    sample c;

    c = a + b;
    cout << c.x << " " << c.y;

    return 0;
}
```

a) `int sample::operator+(sample param)`

b) `int operator+(sample param)`

c) `sample sample::operator+(sample param)`

d) `sample operator+(sample param)`

Answer: c)

Question 10

What will be the output of the following program? **MCQ**
Marks 2

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

class Sample {
    int x;
    int y;
public:
    void setx(int n) { x = n; cout << x; }
    void sety(int m) { y = m; cout << y;}
    int gety() { return y;}
    int getx() { return x; }
};

class Experiment {
public:
    void display(Sample t) {
        t.setx(10);
    }
};

int main() {
    Sample t;
    Experiment e;
    e.display(t);

    return 0;
}
```

a) `10`

b) Compilation Error: `setx()` method of class `Sample` cannot be accessed in class `Experiment`

c) Compilation Error: Illegal object passed as parameter

d) Compilation Error: Variable `x` is private in `Sample`, cannot be accessed in class `Experiment`

Answer: a)

Question 11

Fill in the blank. **MCQ**

Marks 2

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

class Test {
static int x;
public:
    void get() { x = 15; }
    void print() {
        x = x + 20;
        cout << "x = " << x << endl;
    }
};

____________; // Define static variable 'x' in class Test

int main() {
    Test o1, o2;
    o1.get(); o2.get();
    o1.print(); o2.print();

    return 0;
}
```

a) `int Test t.x = 0;`

b) `Test t; t.x = 0;`

c) `int Test::x = 0;`

d) `Test t; t::x = 0;`

Answer: c)

Question 12

What will be the output of the following program? **MCQ**
Marks 2

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

class Test { int x;
public:
    Test(int i) : x(i) {}
    friend void print(const Test& a);
};

void print(const Test& a) {
    cout << "x = " << a.x;
}

int main(){
    Test t(10);
    print(t);

    return 0;
}
```

a) Compilation Error: Const parameter cannot be passed in friend function

b) Compilation Error: `print()` cannot access `x` as it is private

c) Compilation Error: illegal parameter passing in `print()`

d) `x = 10`

Answer: d)

Question 13

Fill in the blanks so that following code will compile. **MCQ**
Marks 2

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

class Complex {
    double re, im;
public:
    explicit Complex(double r = 0, double i = 0) : re(r), im(i) { }
    void disp() { cout << re << " +j " << im << endl; }

    friend Complex operator+ (const Complex &a, const Complex &b) {
        return Complex(a.re + b.re, a.im + b.im);
    }

    ____________________________________________________ {
        Complex b(d); return a + b;
    }

    friend Complex operator+ (double d, const Complex &b) {
        Complex a(d); return a + b;
    }
};

int main(){
    Complex d1(2.5, 3.2), d2(1.6, 3.3), d3;

    d3 = d1 + d2; d3.disp();
    d3 = d1 + 6.2; d3.disp();
    d3 = 4.2 + d2; d3.disp();

    return 0;
}
```

a) `friend Complex operator+ (double a, const Complex &b)`

b) `friend Complex operator+ (double a, double d)`

c) `friend Complex operator+ (const Complex &a, double d)`

d) `friend Complex operator+ (const Complex &a, const Complex &b)`

Answer: c)

Question 14

What is the output of the following program? **MCQ**
Marks 2

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

class Base {
public:
    void func_f1(int i) { cout << "In base func_f1 "; }
    void func_f2(int i) { cout << "In base func_f2 "; }
};

class Derived: public Base {
public:
    void func_f1(int i )   { cout << "In derived func_f1 "; }
    void func_f1(string s) { cout << "func_f1 string "; }
    void func_f3(int i)    { cout << "In derived func_f3 "; }
};

int main() {
    Base b;
    Derived d;

    d.func_f1(3);
    d.func_f1("Blue");
    d.func_f3(3);
    d.func_f2(3);

    return 0;
}
```

a) Compilation Error: Cannot add new parameters to `func_f1`

b) `In derived func_f1 func_f1 string In derived func_f3 In base func_f2`

c) `In base func_f2 func_f1 string In derived func_f3 In derived func_f1`

d) Compilation Error: Cannot define `func_f3` containing same parameter type as `func_f1`

Answer: b)

Question 15

What is the output of the following program? **MCQ**
Marks 2

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

class Base {
protected:
    int marker;
public:
    Base(int m = 4) : marker(m) {}
    virtual ~Base() {};
    virtual void Action() { ++marker; }
};

class Derived : public Base {
public:
    void Action() {
        static_cast<Base>(*this).Action();
        marker *= 2;
        cout << marker << endl;
    }
};

int main() {
    Base *p = new Derived;

    p->Action();

    return 0;
}
```

a) 10

b) 8

c) 4

d) 5

Answer: b)

Question 16

What is the output of the following program? **MCQ**
Marks 2

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

class Test {
    int i;
public:
    Test(int ii) : i(ii) {}
    const Test operator*(const Test& rv) const {
        cout << "Executes *" << endl;
        return Test(i * rv.i);
    }
    const Test operator+(const Test& rv) const {
        cout << "Executes +" << endl;
        return Test(i + rv.i);
    }
    Test& operator+=(const Test& rv) {
        cout << "Executes +=" << endl;
        i += rv.i;
        return *this;
    }
};

int main() {
    int i = 1, j = 2, k = 3;
    Test ii(i), jj(j), kk(k);
    kk += ii * jj;

    return 0;
}
```

a)
```
Executes *
Executes +=
```

b)
```
Executes *
Executes +
```

c)
```
Executes +=
Executes *
```

d) Compilation Error: Ambiguous declaration

Answer: a)

III Unseen (16 Questions of 2 marks each)

Question 1

What is the output of the following program? **MCQ**
Marks 2

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

int main() {
    char str[]= "Programming";
    stack<char> s;

    for(unsigned int i = 0; i < strlen(str); ++i)
        s.push(str[i]);

    for(unsigned int i = 0; i < strlen(str) - 2; ++i) {
        cout << s.top();
        s.pop();
    }

    return 0;
}
```

a) `ogramming`

b) `gramming`

c) `gnimmarg`

d) `gnimmargo`

Answer: d)

Question 2

What is the output of the following code? **MCQ**

Marks 2

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

namespace myNS {
    int abs(int n) {
        if (n < 2) return 0;
        if (n > 2) return 1;
        if (n < 0) return -n;

        return n;
    }
}

int main() {

    cout << abs(-6) << myNS::abs(-6) << endl;

    return 0;
}
```

a) Compilation Error: call to `abs` is ambiguous

b) `00`

c) `66`

d) `60`

Answer: d)

Question 3

What is the output of the following code? **MCQ**

Marks 2

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

class MyClass {
public:
    int i, j, k;
    MyClass(int x = 2) : i(x), j(2) { cout << i << " " << j << " "; }
    MyClass(int x, int y, int z) : i(x), j(y), k(z) {
        cout << i << " " << j << " " << k << " "; }
    MyClass(int x, int y) : i(x), j(y), k(8) {
        cout << i << " " << j << " " << k << " "; }

};

int main() {
    MyClass o1(1), o2(o1), o3(0, 1), o4;

    return 0;
}
```

a) Compilation Error: Default constructor not defined for Call to `o4`

b) 1 2 1 2 0 1 8 2 2

c) 1 2 0 1 8 2 2

d) Compilation Error: Call to `o3(0, 1) and o1(1)` is ambiguous

Answer: c)

Question 4

What will be the output of the following program? **MCQ**
Marks 2

```
#include <stdio.h>

int func(int, int);

#define func(x, y) x / y - x / y

int main() {
    int i = 4, j = 5;
    printf("%d ", func(i - j, 2));

#undef func
    printf("%d\n", func(i - j, 2));

    return 0;
}

int func(int x, int y) {
    return x - y + x - y;
}
```

a. `-4 -4`

b. `0 -6`

c. `-4 -6`

d. `-6 -6`

Answer: c)

Question 5

What is the output of the following program? **MCQ**

Marks 2

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

class Sample {
    string name;

    public:
    Sample(string s): name(s) {
        cout << name << " Created" << " ";
    }

    ~Sample() {
        cout << name << " Destroyed" << " ";
    }
};

int main() {
    Sample * s1 = new Sample("s1");
    Sample * s2 = new Sample("s2");

    return 0;
}
```

a) `s1 Created s2 Created s2 Destroyed s1 Destroyed`

b) `s1 Created s2 Created s1 Destroyed s2 Destroyed`

c) `s2 Created s1 Created s2 Destroyed s1 Destroyed`

d) `s1 Created s2 Created`

Answer: d)

Question 6

What will be the Output of the following program ? **MCQ**

Marks 2

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

struct A {
    int data;
    A(int d) : data(d) {}
    operator int () { return data; }
};

struct B {
   int data;
   B(int d) : data(d) {}
   operator int () { return data+1; }
};

A operator+(struct A& a, struct B& b) {
    return (a.data + b.data) % 0;
}

int main() {
    A a(6);
    B b(3);

    cout << a + a + b << endl;

    return 0;
}
```

a) `3`

b) Error: Integer division by zero

c) `15`

d) `16`

Answer: d)

Question 7

What do the statements A# and B# invoke? Copy assignment operator or Copy constructor?

MCQ

Marks 2

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

class Sample {
public:
    int data_, graph_;
    Sample(int x): data_(x), graph_(0) {
        cout << data_ << " " << graph_ << " ";
    }

    Sample(int x, int y): data_(x), graph_(y) {
        cout << data_ << " " << graph_ << " ";
    }

    Sample(const Sample &s): data_(s.data_), graph_(s.graph_) {
        cout << data_ << " " << graph_ << " ";
        cout << " Copy Constructor ";
    }

    Sample& operator = (const Sample &s) {
        data_= s.data_; graph_= s.graph_;
        cout << data_ << " " << graph_ << " ";
        cout << " Copy Assignment ";

        return (*this);
    }
};

int main() {
    Sample s1(4), s3(9,7);
    Sample s2 = s1; // A#
    s1 = s3;        // B#

    return 0;
}
```

a) `A#`: Copy Assignment; `B#`: Copy Constructor

b) `A#`: Copy Constructor; `B#`: Copy Assignment

c) Both `A#` and `B#` invoke Copy Assignment

d) Both `A#` and `B#` invoke Copy Constructor

Answer: b)

Question 8

What will be the output of the following code snippet? **MCQ**
Marks 2

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

class Main {
public:
     Main()  { cout << "Main Constructed" << " "; }
     ~Main() { cout << "Main Destroyed" << " "; }
};

class Child: public Main {
public:
    Child()  { cout << "Child Constructed" << " "; }
    ~Child() { cout << "Child Destroyed\n" << " "; }
};

int main() {
    Child *d = new Child();
    Main *b = d;
    delete b;

    return 0;
}
```

a) `Main Constructed Child Constructed Main Destroyed`

b) `Main Constructed Child Constructed Child Destroyed Main Destroyed`

c) `Child Constructed Main Constructed Main Destroyed Child Destroyed`

d) `Child Constructed Main Constructed Child Destroyed Main Destroyed`

Answer: a)

Question 9

Identify the abstract classes in the following code snippet. **MCQ**
Marks 2

```
class Vehicle {
public:
    virtual void drive() = 0 { cout << "Vehicle"; }
};

class LandVehicle: public Vehicle  {
    void drive() { cout << "Land Vehicle";}
};

class AirVehicle: public Vehicle {
};

class Car : public LandVehicle {
public:
    void drive() { cout << "Car"; }
};

class Truck : public LandVehicle {
public:
    void drive() {  cout << "Truck";}
};

class Aeroplane : public AirVehicle {
public:
    void drive() { cout << "Aeroplane";}
};

class Indigo : public Aeroplane {
};
```

a) `Vehicle, LandVehicle, AirVehicle`

b) `Vehicle, AirVehicle, Indigo`

c) `Vehicle, AirVehicle`

d) `Vehicle`

Answer: c)

Question 10

What will be the output of the program? **MCQ**
Marks 2

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

class Book {
    int number;
public:
    Book (int num = 0): number(num) { }
protected:
    void pages() { cout << number << " Pages "; }
};

class Pages {
public:
    Pages() : ro(1000) { }

    void Write() { ro.pages(); }
private:
    Book  ro;
};

int main() {
    Pages B;

    B.Write();

    return 0;
}
```

a) `0 Pages`

b) `1000 Pages`

c) Compilation Error: `ro` cannot be accessed as `ro` is private

d) Compilation Error: `pages()` cannot be accessed as it is protected

Answer: d)

Question 11

What will be the output of the following program? **MCQ**
Marks 2

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

class S {
public:
    virtual void f() { cout << "S->f "; }
    void g() { cout << "S->g "; }
};

class Y : public S {
public:
    void f() { cout << "Y->f "; }
    virtual void g() { cout << "Y->g "; }
};

int main() {
    Y y;
    S &s = y;

    y.g();
    s.f();
    s.g();

    return 0;
}
```

a) `Y->g Y->f Y->g`

b) `Y->g S->f S->g`

c) `Y->g Y->f S->g`

d) `S->g Y->f S->g`

Answer: c)

Question 12

How many virtual tables will be set up by the compiler for the following program? **MCQ**
Marks 2

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

class Base {
public:
    virtual void function1() {};
    virtual void function2() {};
    virtual void function3() {};
};

class D1: public Base {
public:
    virtual void function1() {};
};

class D2: public Base {
public:
    virtual void function2() {};
    virtual void function1() {};
};

class D3: public Base {
public:
    virtual void function3() {};
};
```

a) 2

b) 1

c) 4

d) 3

Answer: c)

Question 13

What will be the output of the following program? **MCQ**
Marks 2

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

class Base {
protected:
    double var;
public:
    virtual void fun() = 0;
    Base(double i) { var = i; }
};

class Derived: public Base {
    double dervar;
public:
    Derived(double i, double  j): Base(i) { dervar = j; }
    void fun() { cout << "var = " << var << ", dervar = " << dervar; }
};

int main(void) {
    Derived d(14.6, 8);
    d.fun();

    return 0;
}
```

a) Compilation Error: Pure virtual function

b) `var = 14.6, dervar = 8`

c) Compilation Error: Invalid access in Constructor

d) Compilation Error: Undefined reference of `fun()`

Answer: b)

Question 14

What will be the output of the following program? **MCQ**
Marks 2

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

class Test {
public:
    Test() { cout << "Created" << endl; }
    ~Test() { cout << "Destroyed "  << endl; }
};

int main() {
    try {
        Test t1;
        throw 98;
    }

    catch(char i) {
        cout << "Caught Char " << i << endl;
    }

    catch(double i) {
        cout << "Caught Double " << i << endl;
    }

    catch(...) {
        cout << "Default"  << endl;
    }

    return 0;
}
```

a)
```
Created
Destroyed
Caught Char b
```

b)
```
Created
Caught Char b
Destroyed
```

c)
```
Created
Caught Double 98
Destroyed
```

d)
```
Created
Destroyed
Default
```

Answer: d)

Question 15

Fill in the blank in the following code to get the output: `4 c`. **MCQ**
Marks 2

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

---------------------------------
int arrMax(T arr[], int n)   { // Fill the blank
    int m = min;
    for (int i = 0; i < n; ++i) {
        if (arr[i] > m)
             m = arr[i];
    }
    return m;
}

int main() {
    int arr1[]  = {1, 2, 3, 4};
    int n1 = sizeof(arr1)/sizeof(int);

    char arr2[] = {'a', 'b', 'c'};
    int n2 = sizeof(arr2)/sizeof(char);

    cout << arrMax<int, 1>(arr1, n1) << " ";
    cout << (char)arrMax<char, 'a'>(arr2, n2);

    return 0;
}
```

a) `template <T, int min>`

b) `template <class T, int min>`

c) `template <class T>, int min`

d) `template <T>, int min`

Answer: b)

Question 16

Identify the correct statement/s about the following program. **MSQ**
Marks 2

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

class Employee {
public:
    string name, addr;
    const int id;
    string dob;

    Employee(string nm, string ad, string dt, int d):
         name(nm), addr(ad), dob(dt), id(d) { }

    void print_attr_dob() const {
        this->dob = "12-02-1986";
        cout << this->dob ;
    }

    void print_attr_name() {
        cout << this->name ;
    }
};

static int e_code = 1;

int main() {
    const Employee e1("Ram", "Kolkata", "12-02-02", e_code++);

    e1.print_attr_dob();
    e1.print_attr_name();
    return 0;
}
```

a) Compilation Error: `print_attr_dob()` cannot assign value to `dob`

b) Compilation Error: cannot convert '`this`' pointer from '`const Employee`' to '`Employee`' for `print_attr_dob()`

c) Compilation Error: cannot convert '`this`' pointer from '`const Employee`' to '`Employee`' for `print_attr_name()`

d) `12-02-1986Ram`

Answer: a), c)