CS165 Final Exam Practice **Name: _____**

Instructions: This is a closed book, closed note, and closed computer test. Please write your answer (A, B, C, or D) clearly in the Answer column. Please ensure your name is written above. Turn in your test when you are completed.

Problem	Question	Choices	Answer

1	Consider the following structure:
	
	struct Student
	{
	  string name;
	  float gpa;
	  string major;
	};
	
	If a function created a variable called "Student aStudent", how would you set the gpa to 4.0?
		a) aStudent = 4.0;
		
		b) aStudent.gpa = 4.0;
		
		c) aStudent->gpa = 4.0;
		
		d) aStudent[gpa] = 4.0;	

2	Using the same Student structure in the above question, what would you put inside the for loop to initialize the gpa to 0.0 for all students?
	
	Student classRoom[20];
	for(int i=0; i<20; i++)
	{
	  // Add code here
	}
		a) classRoom = 0.0;
		
		b) classRoom.gpa[i] = 0.0;
		
		c) classRoom[i].gpa = 0.0;
		
		d) classRoom.gpa = 0.0;	

3	How can a function throw an exception containing the text "Invalid Timestamp" to the calling function?	a) throw string("Invalid Timestamp"); b) try "Invalid Timestamp"; c) return "Invalid Timestamp"; d) catch "Invalid Timestamp";	

4	What is the output of the following code if the parseLine function throws an exception of type string?
	
	string line = "Simple Gifts";
	try
	{
	  cout << "Parsing" << endl;
	  parseLine(line);
	  cout << line << endl;
	}
	catch (string errStr)
	{
	  cout << "Parse Error" << endl;
	}
		a) Parsing
		Simple Gifts
		Parse Error
		
		b) Parsing
		Parse Error
		
		c) Parsing
		Simple Gifts
		
		d) Parse Error	

Problem	Question	Choices	Answer

5	Consider the following function:
	
	int process(int x, int y = 2, int z = 7)
	{
	  return (x + y + z);
	}
	
	What will the output be of the following:
	
	cout << process(3, 5);
		a) 8
		
		b) 12
		
		c) 15
		
		d) 17	

6	Which of the following is <u>not</u> a true statement about classes?	a) Classes can contain both member data and member functions. b) An instance (or a variable) of a class is called an object. c) The encapsulation of data and functions in a class allows the implementation of object behavior to be hidden from the user of the object. d) Like a structure, all member data in a class is always accessible to the user of the object.	

7	Consider the following class:
	
	class Product
	{
	  private:
	  string name;
	  float basePrice;
	
	  public:
	  string getName() const;
	  void setName(string name);
	  void rename(string name);
	};
	
	If an object called “toy” of class Product was created, which of the following would <u>not</u> result in a compiler error?
		a) toy.setName();
		
		b) toy.basePrice = 19.95;
		
		c) string toyName = toy.getName();
		
		d) cout << toy.name << endl;	

Problem	Question	Choices	Answer

8	Consider the following member function:
	
	void Order::setQuantity(int quantity)
	{
	  this->quantity = quantity;
	}
	
	What does "this" represent?
		a) The address of the Order object
		
		b) The address of the quantity parameter in the function
		
		c) The address of the class variable called quantity
		
		d) The address of the function calling setQuanity.	

9	Which of the following techniques would provide access to member data outside of the class?	a) Declare the member data as private b) Provide an accessor function for the member data c) Provide a mutator function for the member data d) Declare the member data as a friend	
10	Which of the following is <u>not</u> true about default and non-default constructors?	a) If the code has neither a default nor a non-default constructor, the compiler will create a default constructor that performs no initialization of data. b) Non-default constructors have no parameters and Default constructors have parameters provided by the user. c) The code can have only one default constructor but can have many non-default constructors. d) Default and Non-Default constructors should not be called directly but are executed when an object is created by another function or object.	

11	Consider the following non-default constructor in a Point class:
	
	Point(int x, int y);
	
	How would you create a Point object using this non-default constructor?
		a) Point p;
		
		b) Point p = p(3,4);
		
		c) Point p = new p(3,4);
		
		d) Point p(3,4);	

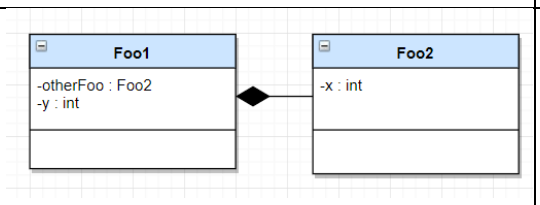
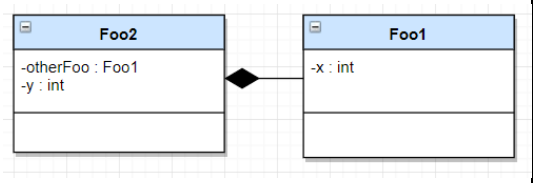
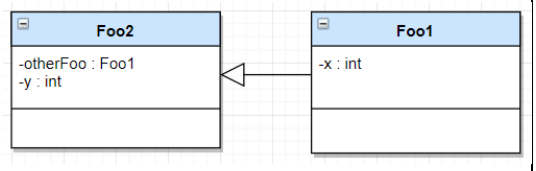
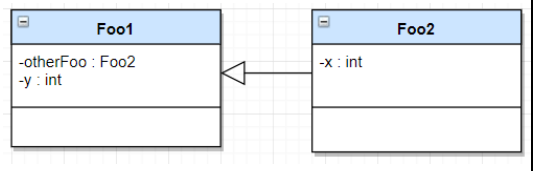
Problem	Question	Choices	Answer

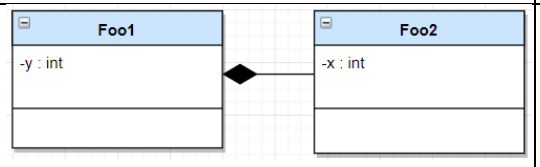
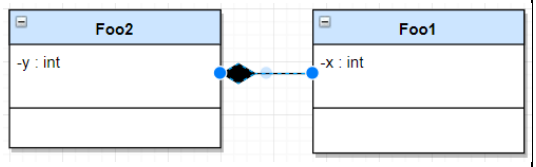
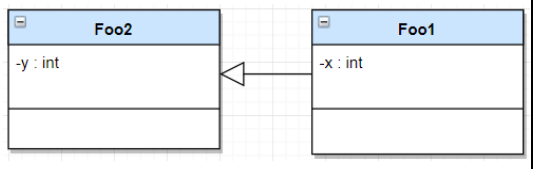
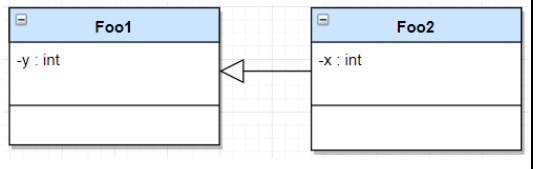
12	Consider the following class:
	
	class Product
	{
	  private:
	  string name;
	  int price;
	  string description;
	
	  public:
	  string getName() {return name;}
	  int getPrice();
	  string getDescription();
	};
	
	int Product::getPrice()
	{
	  return price;
	}
	
	inline string Product::getDescription()
	{
	  return description;
	}
	
	Which functions in the class are considered inline functions?
		a) getName, getPrice, getDescription
		
		b) getName, getDescription
		
		c) getPrice, getDescription
		
		d) getDescription	

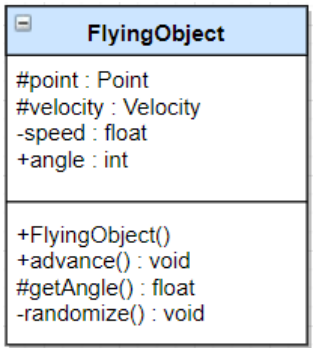
13	If the Lander class has a function called draw which is not supposed to modify any member data in the class, what is the correct way to ask the compiler to enforce this constraint?	a) void draw(const);
		
		b) void draw();
		
		c) void draw() const;
		
		d) void draw() inline;	

14	In a makefile, when specifying the commands (ex: g++ -c ship.cpp) to generate a target (ex: ship.o), what should be put in front of each command?	a) Nothing b) 3 Spaces c) 1 Tab d) 1 Colon	

Problem	Question	Choices	Answer

15	Consider the following classes:
	
	class Foo2
	{
	  private:
	  int x;
	};
	
	class Foo1
	{
	  private:
	  Foo2 otherFoo;
	  int y;
	};
	
	Which UML diagram represents these classes?
		a) 
		b) 
		c) 
		d) 	

16	Consider the following classes:
	
	class Foo2
	{
	  private:
	  int y;
	};
	
	class Foo1 : public Foo2
	{
	  private:
	  int x;
	};
	
	Which UML diagram represents these classes?
		a) 
		b) 
		c) 
		d) 	

Problem	Question	Choices	Answer
17	Consider the following UML class diagram:  Which member data is private?	a) Point point b) float getAngle() c) float speed d) void advance()	

18	Consider the following classes:
	
	class Velocity
	{
	  private:
	  float dx;
	  float dy;
	
	  public:
	  float getDx() {return dx;}
	  float getDy() {return dy;}
	};
	
	class Lander
	{
	  private:
	  Velocity velocity;
	  public:
	  Velocity getVelocity() {return velocity;}
	};
	
	class Game
	{
	  private:
	  Lander lander;
	  public:
	  void display() { // Print Lander dx }
	};
	
	What code should be put in the Game display function to display the dx velocity for the Lander?
		a) cout << lander.getVelocity().getDx();
		
		b) cout << Lander.Velocity.dx;
		
		c) cout << lander.getVelocity.dx;
		
		d) cout << this->getVelocity().getDx();	

Problem	Question	Choices	Answer
19	Consider a class called Order which has a private data member declared as follows: static int orderID; How can the class initialize this to 1 before the first Order object is created?	a) Change the orderID to public instead of private. b) Change the member data declaration to be: “static int orderID = 1;” c) The compiler will automatically initialize the data to 1. d) Put the following outside the class definition: “int Order::orderID = 1;”	

20	Consider the following code:
	
	int *ptr = 0;
	int value = 42;
	
	Which of the following lines of code if added next would cause a segmentation fault?
		a) ptr = &value;
		
		b) ptr++;
		
		c) *ptr = value;
		
		d) value--;	

21	Consider the following code where the Bird class has a constructor that takes a Point and a public function called hit:
	
	Point p;
	Bird *bird = new Bird(p);
	
	What code is used to call the hit function?
		a) Bird::hit();
		
		b) bird->hit();
		
		c) bird.hit();
		
		d) this->hit();	

22	Which of the following is <u>not</u> true about class inheritance?	a) Derived Classes do not have access to private data and functions in the base class. b) Functions that have the same implementation for all derived classes should be put in the base class. c) Functions implemented in the base class can be overloaded in a derived class. d) The constructor in the derived class will execute before the constructor in the base class.	

Problem	Question	Choices	Answer
23	Which of the following pairs of classes is the best example of inheritance (ISA relationship)	a) Time and Clock b) Checking Account and Bank Account c) Race and Runners d) Quiz and Homework	

24	Consider the following code:
	
	class FlyingObject
	{
	protected:
	Point p;
	private:
	int angle;
	};
	
	class Rock : public FlyingObject
	{
	protected:
	int rotation;
	private:
	int color;
	};
	
	class LargeRock : public Rock
	{
	private:
	bool madeOfCheese;
	};
	
	Which variables does a LargeRock object have access to?
		a) p, angle, rotation, color, madeOfCheese
		
		b) rotation, madeOfCheese
		
		c) p, rotation, madeOfCheese
		
		d) rotation, color, madeOfCheese	

Problem	Question	Choices	Answer
25	Which of the following is <u>not</u> true about virtual functions?	a) A function is pure virtual if the base class has no implementation for the function but all derived classes provide an implementation. b) If a derived class does not implement a virtual function declared in a base class, then a linker error will result. c) An object of either the base class or the derived classes can be created if a pure virtual or virtual function is declared in the base class. d) The compiler can determine which derived class implementation of a virtual function to execute.	

26	If the FlyingObject class has the following three constructors:
	
	FlyingObject();
	FlyingObject(Point p);
	FlyingObject(Point p, float speed);
	
	How can the following Bullet constructor (which inherits from the FlyingObject class) be written to ensure that only the 3rd FlyingObject constructor (which takes a Point and a float) is called:
	
	Bullet::Bullet(Point p, float speed)
	{
	…
	}
		a) In the constructor call "FlyingObject(p, speed);"
		
		b) The compiler will automatically call the correct one.
		
		c) In the constructor call "FlyingObject::FlyingObject(p, speed);"
		
		d) After the Bullet constructor declaration, use an initializer as follows: " : FlyingObject(p, speed)"	

Problem	Question	Choices	Answer

27	Consider the following classes:
	
	class Base
	{
	  public:
	  virtual void display() = 0;
	};
	
	class Derived1 : public Base
	{
	  public:
	  void display() {cout << “Dervied1”;}
	};
	
	class Derived2 : public Base
	{
	  public:
	  void display() {cout << “Derived2”;}
	};
	
	class Derived3 : public Base
	{
	  public:
	  void display() {cout << “Derived3”;}
	};
	
	Which of the following code will <u>not</u> display “Derived2” to the screen due to a compiler error?
		a) Derived2 obj;
		obj.display();
		
		b) Derived2*obj = new Derived2();
		obj->display();
		
		c) Base obj = Derived2();
		obj.display();
		
		d) Base *obj = new Derived2();
		obj->display();	

28	How do you declare a vector that stores pointers to Bullet objects?	a) vector<Bullet *> bullets; b) vector<Bullet> bullets; c) vector bullets; d) vector<Bullet> bullets = new Vector();	

29	Consider the following code:
	
	vector<Rock *>::iterator it = rocks.begin();
	while (???)
	{
	  // Do something
	  it++;
	}
	
	What should be put in “???” to allow the while loop to traverse all rocks?
		a) *it == rocks.rend()
		
		b) *it == rocks.end()
		
		c) it != rocks.rend()
		
		d) it != rocks.end()	

Problem	Question	Choices	Answer

30	Consider the following code where bullets is a vector of pointers to Bullet objects:
	
	for (int i=0; i<???; i++)
	{
	  if (bullets[i]->isAlive())
	  {
	  bullets[i]->draw();
	  }
	}
	
	What should be put in "???" to ensure that all non-dead bullets are drawn to the screen?
		a) bullets.size
		
		b) bullet.count
		
		c) bullets.size()
		
		d) bullets.count()	

31	Which of the following is <u>not</u> true about the difference between the vector STL class and the list STL class?	a) The list is more efficient at removing data from the collection as compared to the vector. b) The vector can be accessed with the [ ] operator but the list does not. c) The vector can add an item to the end of the collection but a list cannot. d) The vector is less efficient at inserting data into the collection as compared to the list.	

32	Consider the following class:
	
	template <class A, class B>
	class Pair
	{
	  private:
	  A item1;
	  B item2;
	};
	
	What would the function declaration be for a function that will set item2?
		a) void setItem2(A item2);
		
		b) void setItem2(B item2);
		
		c) void setItem2(<A> item2);
		
		d) void setItem2(<B> item2);	

33	Using the class in the above question, select the correct syntax for creating an object of class Pair where item1 is an integer and item2 is a string.	a) Pair(string,int) pair; b) Pair pair<int,string>; c) Pair<int,string> pair; d) Pair<string,int> pair;	

Problem	Question	Choices	Answer

34	Consider the following non-member overloaded operator:
	
	inline ostream& operator <<(ostream &lhs, const Point &rhs)
	{
	  ??? << rhs.getX() << "," << rhs.getY();
	  return lhs;
	}
	
	What should replace "???" in the code to allow for both writing to the screen or to a file?
		a) lhs
		
		b) rhs
		
		c) cout
		
		d) cin	

35	Which of the following function declarations would be used to overload the += operator as a member function?	a) Point& operator +=(const Point &lhs, const Point &rhs);
		
		b) inline Point& operator +=(const Point &lhs, const Point &rhs);
		
		c) Point& operator +=(const Point &rhs);
		
		d) The += operator can only be overloaded as a non-member function.	

36	In the following non-member overloaded operator, how can the code be simplified by putting the keyword "friend" in front of the function and by placing the function inside the Point class definition?
	
	inline Point operator +(const Point &lhs, const Point &rhs)
	{
	  Point result;
	  result.setX(lhs.getX() + rhs.getX());
	  result.setY(lhs.getY() + rhs.getY());
	  return result;
	}
		a) No improvement. The friend keyword only applies to member functions.
		
		b) Get and Set functions would not be needed because the function would have access to private data within the Point class.
		
		c) This would allow you to remove the lhs parameter and still be a non-member function.
		
		d) The Get functions would not be needed but the Set functions would still be needed.	

Problem	Question	Choices	Answer

37	Consider the following non-member overloaded operator:
	
	friend bool operator ==(const Point &lhs, const Point &rhs)
	{
	  return ((lhs.x == rhs.x) && (lhs.y == rhs.y));
	}
	
	What would the implementation be for:
	
	friend bool operator !=(const Point &lhs, const Point &rhs)
	{
	  …
	}
		a) return ((lhs.x != rhs.x) && (lhs.y != rhs.y));
		
		b) return (rhs == lhs);
		
		c) return !((lhs.x != rhs.x) && (lhs.y != rhs.y));
		
		d) return !(lhs == rhs);	

38	What is the relationship between the copy constructor, the assignment overloaded operator, and the destructor?	a) All 3 must be considered if the class performs dynamic memory allocation. b) The copy constructor and the assignment overload operator do the exact same thing. c) The copy constructor and the assignment overload operator must directly call the destructor. d) If one of the 3 are defined in a class, then the compiler will require that all 3 are implemented.	

39	Which of the following code would cause the copy constructor to be called for a class called Array with a non-default constructor that receives a single integer?	a) Array a1(10);
		Array a2(10);
		
		b) Array a1(10);
		Array a2(a1);
		
		c) Array *a1 = new Array(10);
		Array *a2 = a1;
		
		d) Array a1(10);
		Array a2(10);
		a2 = a1;	

Problem	Question	Choices	Answer
40	Which of the following is not true about destructors?	a) A class does not have to implement a destructor. b) A class can have more than one destructor. c) A destructor has not parameters or return type. d) If a destructor is defined, it will execute if the memory for the object is deallocated (e.g. delete is called).	

-- End of Test --