



# CENTRAL UNIVERSITY

SCHOOL OF ARCHITECTURE AND SCIENCE

END OF FIRST SEMESTER EXAMINATION - 2017/18

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

COURSE CODE: ITEC 206

OBJECT ORIENTED PROGRAMMING LANGUAGE

BSC INFORMATION TECHNOLOGY

2 Hours

STUDENT INDEX No .....

## INSTRUCTIONS

- Answer all Questions in section A
- Answer all three (3) Questions in Section B

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*Course Lecturer: Mr. J. K. Appiah*

**Section A**  
**Answer all Questions, 2 marks each**

1. Which of the following mechanisms is/are provided by Object Oriented Language to implement Object Oriented Model?

- a) Encapsulation
- b) Inheritance
- c) Polymorphism
- d) All of the mentioned

2. What is the output of this program?

```
1. class Test {
2.     int a;
3.     public int b;
4.     private int c;
5. }
6. class AccessTest {
7.     public static void main(String args[])
8.     {
9.         Test ob = new Test();
10.        ob.a = 10;
11.        ob.b = 20;
12.        ob.c = 30;
13.        System.out.println(" Output :a, b, and c" + ob.a + " " + ob.b + " " + ob.c);
14.    }
15. }
```

- a) Compilation error
- b) Run time error
- c) Output : a, b and c 10 20 30
- d) None of the mentioned

3. Which of the following is a mechanism by which object acquires the properties of another object?

- a) Encapsulation
- b) Abstraction
- c) Inheritance
- d) Polymorphism

4. Which of the following supports the concept of hierarchical classification?

- a) Polymorphism
- b) Encapsulation
- c) Abstraction
- d) Inheritance

5. In a student grading system, Student Last Name, Student Address, and Final Course Grade would all be classified as what?

- A) Inheritance
- B) Information
- C) Encapsulation
- D) Polymorphism

6. In a student grading system, objects from different classes communicate with each other. These communications are known as \_\_\_\_\_.

- A) inheritance
- B) polymorphism
- C) messages
- D) concealment

7. When an object has many forms, it has \_\_\_\_\_.

- A) Inheritance
- B) Scalability
- C) Encapsulation
- D) Polymorphism

8. What common technique attempts to save time and energy by reducing redundant work in object-oriented programming?

- A) Reduce lines of programming
- B) Reuse of code
- C) Reduce size of systems being developed
- D) Merging different systems together

9. Access to private data is \_\_\_\_\_.

- a) Restricted to methods of the same class
- b) Restricted to methods of other classes
- c) Available to methods of the same class and other classes
- d) Not an issue because the program will not compile

10. How will a class protect the code inside it?

- a) Using Access specifiers
- b) Abstraction
- c) Use of Inheritance
- d) All of the mentioned

11. What type of relationship exists between someMeth in classes A and someMeth in class B?

```
class A
{
private void someMeth()
    {
        System.out.println( "from class A" );
    }
}
```

```
class B extends A
{
public void someMeth(String x )
{
    System.out.println( "from class B: " + x );
}
}
```

- (a) method overriding
- (b) method overloading
- (c) both method overriding and method overloading
- (d) neither method overriding nor method overloading

12. A constructor that accepts \_\_\_\_\_ parameters is called the default constructor.

- a. One
- b. Two
- c. Three
- d. No

13. Which of the following statement is correct?

- a. Constructor has the same name as that of the class.
- b. Destructor has the same name as that of the class with a tilde symbol at the beginning.
- c. Both A and B.
- d. Destructor has the same name as the first member function of the class.

14. Which allows you to create a derived class that inherits properties from more than one base class?

- a. Multilevel inheritance
- b. Multiple inheritance
- c. Hybrid Inheritance
- d. Hierarchical Inheritance

- 15 Which of the statements is true in a protected derivation of a derived class from a base class?
- A. Private members of the base class become protected members of the derived class
  - B. Protected members of the base class become public members of the derived class
  - C. Public members of the base class become protected members of the derived class
  - D. Protected derivation does not affect private and protected members of the derived class
- 16 The functions that are defined inside a class are called
- A. Member functions
  - B. Public functions
  - C. Implemented functions
  - D. None of them
17. To make large programs more manageable programmers modularize them into subprograms that are called
- A. Operators
  - B. Classes
  - C. Functions
  - D. None of them
18. A type of variable that stores an address is called
- A. Operator
  - B. Function
  - C. Pointer
  - D. None of them
19. Variables declared with in a class are called
- a) Identifier
  - b) local variable
  - c) instance variable
  - d) global variable
20. Which of the following is not true?
- (a) An interface can extend another interface.
  - (b) A class which is implementing an interface must implement all the methods of the interface.
  - (c) An interface can implement another interface.
  - (d) None of the above.



## Section B

### Answer all 3 questions from this section

#### Question 1

- a. Briefly explain each of the following terms: [2 marks each, total of 12]
- i. Encapsulation
  - ii. private
  - iii. Public
  - iv. protected
  - v. Virtual Function
  - vi. Superclass
- b. Explain why it is considered good practice to limit the scope of fields and methods in object oriented programming. (4 marks)
- c. What is a Constructor? (2 marks)
- d. What is the difference between constructor and method? (2 marks)

#### Question 2

A company pays its employees on a weekly basis. the employees are of four types: Salaried employees are paid a fixed weekly salary regardless of the number of hours worked, hourly employees are paid by the hour and receive overtime pay (ie 1.5 times their hourly salary rate) for all hours worked in excess of 40 hours; **commission employees** are paid a percentage of their sales and **based-salaried commissions employees** receive a base salary plus a percentage of their sales. The company wants to write an application that performs its payroll calculations polymorphically.

- a) Draw a hierarchical class diagram for the class Employee based on the above description. (5 marks)
- b) what is polymorphism in object oriented programming? use the scenario given in the question to support your answer. (8 marks)
- c) Distinguish between an abstract class and a concrete class. From the diagram, identify which class/classes should be defined as an abstract class and which is to be defined as a concrete class? (5 marks)
- d) how does inheritance promote software reusability? (2 marks)

### Question 3

a) Create a class called Employee that includes three instance variable - a first name (type String), a last name (type string ) and a monthly salary(type double). Provide a *set* and a *get* method for each instance variable. if the monthly salary is not positive, do not set its value. (10 marks)

b) Using an object oriented language with which you are familiar, give an example of the use of inheritance. (10 marks)