



**CENTRAL
UNIVERSITY**

SCHOOL OF ENGINEERING & TECHNOLOGY
END OF SECOND SEMESTER EXAMINATION - 2020/21

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

COURSE CODE: ITEC 206
OBJECT ORIENTED LANGUAGE
BSC. INFORMATION TECHNOLOGY

2 Hours

STUDENT INDEX No

INSTRUCTIONS

- Answer **all** Questions in section A on the Question Paper
- Answer **any three (3)** Questions in Section B

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SO BY THE INVIGILATOR**

Course Lecturer: Mr. J. K. Appiah

Which con
A)
B)

Section A
Answer all Questions, marks each

1. Suppose that a package edu.colorado.foo has two classes Goo and Hoo. Which statement will import both these classes?
 - A. import edu.colorado.*
 - B. import edu.colorado.all
 - C. import edu.colorado.Goo;Hoo
 - D. import edu.colorado.Goo;Hoo
 - E. None of the above.
2. Which option is false about the final keyword?
 - A. A final method cannot be overridden in its subclasses.
 - B. A final class cannot be extended.
 - C. A final class cannot extend other classes.
 - D. A final method can be inherited.
3. To what object-oriented programming concept does the Java keyword private apply?
 - A) Polymorphism
 - B) Inheritance
 - C) Encapsulation
 - D) Overriding
4. Which Java technology best supports the IS-A relationship?
 - A) Inheritance
 - B) Access Restriction
 - C) Strong Typing
 - D) Garbage Collection
5. Which of the following statements is not true about protected data members?
 - A) They can be accessed from the same class.
 - B) They can be accessed from subclasses in the same package.
 - C) They can be accessed from subclasses in different packages.
 - D) They can be accessed from all other classes in the same package.
6. Which Java keyword is used to specify compliance with an interface?
 - A) extends
 - B) implements
 - C) public
 - D) static
7. The variable defined in class is called _____ variable.
 - A) local.
 - B) minimum.
 - C) instance.
 - D) define.

8. Which constructor creates an empty string buffer with the specified capacity as length.
- A) StringBuffer()
 - B) StringBuffer(String str)
 - C) StringBuffer(int capacity)
 - D) None of the above
9. Which concept of Java is a way of converting real world objects in terms of class?
- A) Polymorphism
 - B) Encapsulation
 - C) Abstraction
 - D) Inheritance
10. The subclass constructor uses the _____ keyword to invoke the constructor of the superclass.
- A) super
 - B) Final
 - C) static
 - D) public
11. If we implements ActionListener in our program, then we must override _____ method.
- A) actionPerformed()
 - B) ActionPerformed()
 - C) actionPerfromed()
 - D) actionPerformed()
12. In _____ component we can select multiple items.
- A) Option Button
 - B) Choice
 - C) List
 - D) None of these
13. If we want the program to continue with the execution of the remaining code, then we should try to catch the exception object thrown by the error condition and then display an appropriate message for taking corrective action is known as _____.
- A) Exception handling
 - B) BufferedReader
 - C) Try
 - D) Catch
14. What type of relationship exists between someMethin classes A and someMethin class B?

```
Class A{  
    private void someMeth(){  
        System.out.println("fromclassA");  
    }  
}  
  
Class B extends {  
    public void someMeth(String x ){  
        System.out.println("fromclassB: " + x );  
    }  
}
```


- A) method overriding
- B) method overloading
- C) both method overriding and method overloading
- D) neither method overriding nor method overloading

15. Order of execution of constructors in Java Inheritance is

- A) Base to derived class
- B) Derived to base class
- C) Random order
- D) none

16. Which polymorphism concept is applied to inheritance relationship in java programming?

- A) Method overloading
- B) Constructor overloading
- C) Method overriding
- D) None

17. Given the following method and class signatures:

```
public class A extends Exception {...}
public class B extends A {...}
public class C extends B {...}
public void doStuff() throws A,B,C
```

The following code does not compile. Why?

```
try {
    doStuff();
}
catch(A a) {
    a.printStackTrace(); }
catch(B b) {
    b.printStackTrace(); }
catch(C c) {
    c.printStackTrace(); }
finally {
    System.out.println("I love exceptions!"); }
```

- A) The catch blocks for exceptions of type B and C are unreachable.
- B) A finally block cannot be used with multiple catch blocks.
- C) B and C are not exception classes since they do not extend class Exception and therefore cannot be caught.
- D) No one loves exceptions and therefore the finally block fails to compile.

18. Which class cannot be sub classed?

- A) final class
- B) object class
- C) abstract class

D) ch
19. Java does
A) Inheritance
B) Multiple
C) ...

D) child class

19. Java does not support _____ ?
- A) Inheritance
 - B) Multiple inheritance for classes
 - C) multiple inheritance of interfaces
 - D) compile time polymorphism
20. Encapsulation concept in java is
- A) Hiding complexity
 - B) method hiding
 - C) Hiding constructor
 - D) None
21. Exposing only necessary information to clients (main programs, classes) is known as
- A) Abstraction
 - B) Encapsulation
 - C) Data hiding
 - D) Hiding complexity
22. For Cat and Animal class, correct way of inheritance in java is
- A) class Cat extends Animal
 - B) class Animal extends Cat
 - C) Both are correct way
 - D) None is correct way
23. If you want to write multiple functions in a class with same name, then what Java feature will you use?
- A) Function overriding
 - B) Encapsulation
 - C) Function overloading
 - D) None
24. If I want to have common functions in a class and want to defer implementations of some other functions to derived classes, then we need to use
- A) An interface
 - B) An abstract class
 - C) A static class
 - D) None
25. To prevent a class to be inherited / extended, the class should be
- A) final class
 - B) abstract class
 - C) final and abstract both
 - D) none
26. Which cannot be inherited from a base class in Java programming?
- A) Cannot override private method of a class

- B) Protected methods are visible to only immediate child class
- C) Public methods of a class are visible to all.
- D) All

27. A class which implements the Action Listener interface must implement which method?

- A) void handle(Action Event e)
- B) void actionPerformed(ActionEvent e)
- C) void eventDispatched(AWT Event e)
- D) String getActionCommand(ActionEvent e)

28. Which of the following statements about Java Swing is TRUE?

- A) A BorderLayout distinguishes five regions: LEFT, RIGHT, TOP, BOTTOM and MIDDLE
- B) A JPanel has a title field.
- C) The default JFrame layout is GridLayout
- D) A JFrame is a top-level container.

29. Why would a class be declared as abstract?

- A) Because it doesn't make logical sense to instantiate it
- B) So that it can be used as an interface
- C) So that it cannot be inherited from
- D) Because it has no abstract method

30. Which one of the following lines of Java code may cause a compilation error?

- A) String a = Hello ;
- B) short a = 14;
- C) double a = 14;
- D) int[] a = {1,2,3};

31. Which of the following statements about abstract classes in Java is TRUE?

- A) All methods in an abstract class must be abstract.
- B) Abstract classes can have a constructor.
- C) Abstract classes cannot implement interfaces.
- D) All fields in an abstract class must be abstract.

32. In the context of Java programming, which of the following statements is FALSE?

- A) The name of a constructor is the same as the class name.
- B) Two variables can refer to the same object.
- C) A class can have several constructors.
- D) In a constructor, the parameter names must be different from the field names of the class.

33. Which of the following characteristics of an object-oriented programming language restricts behavior so that an object can only perform actions that are defined for its class?

- A) Dynamic Binding
- B) Polymorphism
- C) Inheritance

D) Encapsulation

34. Fill in the blanks so that the following draws a Frame containing "Hello".

```
import java.awt.*;
```

```
class helloFrame _____ Frame  
{  
    public void _____( Graphics g )  
    {  
        g. _____("Hello", 10, 50 );  
    }  
}
```

```
public class Tester
```

```
{  
    public static void main ( String[] args )  
    {  
        helloFrame frm = new helloFrame();  
        frm.setSize( 150, 100 );  
        frm.setVisible( true );  
    }  
}
```

- A) import, drawString, paint
- B) extends, paint, drawString
- C) extends, draw, paint
- D) include, drawString, paint

35. What is a container object in GUI programming?

- A) A container is another name for an array or vector.
- B) A container is any class that is made up of other classes.
- C) A container is a primitive variable that contains the actual data.
- D) A container is an object like a Frame that has other GUI components placed inside of it.

36. This layout manager arranges as many as five components in five positions identified as North, South, East, West, and Center. Which layout manager is described?

- A) BorderLayout
- B) FlowLayout
- C) GridLayout
- D) GridBagLayout

37. Which of these statements are TRUE?

- i. Protected methods are final.
 - ii. Private methods cannot be override.
 - iii. Private methods are final.
 - iv. Protected members are accessible within a package and inherited classes outside the package.
- A) i, ii, iv

- B) i, ii, iii
- C) i, iii, iv
- D) ii, iii, iv

38. Which of these statements is TRUE about polymorphism?

- A. It is not supported by Java
- B. Refers to the ability of two or more objects belonging to different classes to respond to exactly the different message in different class.
- C. Simplifies code maintenance
- D. Refers to the ability of two or more objects belonging to different classes to respond to exactly the same message in different class –specific ways and simplifies code maintenance

39. What is an abstract class?

- A. An abstract class is one without any child classes.
- B. An abstract class is any parent class with more than one child class.
- C. An abstract class is a class which cannot be instantiated, but can be a base class.
- D. abstract class is another name for "base class".

40. To what object-oriented programming concept does the Java keyword *private* apply?

- A. Polymorphism
- B. Inheritance
- C. Encapsulation
- D. Overriding

Section B

Answer 3 questions only from this section

Question 1

[2 marks each, total of 10]

A. Briefly explain each of the following Java terms:

- i. Class
- ii. Constructor
- iii. Object
- iv. Protected
- v. encapsulation

B. Explain why it is considered good practice to limit the scope of fields and methods in object oriented programming. (2 marks)

C. What is the difference between a public field and a protected field? (2 marks)

D. What is polymorphism in object oriented programming? Use an example to support your answer (6 marks)

Question 2

- A. Explain *event driven* programming? (2 marks)
- B. Explain the structure of Java program. (4 marks)
- C. State two (2) advantages of event driven programming (2 marks)

D. What is the difference between a variable in a class that is declared static and one that is not? (4 marks)

E. What output does this program produce when it is executed? (Note that the main method is at the bottom. This program does compile and run without errors.) (6 marks)

```
class A {  
    void f() { System.out.println("Af"); }  
    void f(String s) { f(1,s); }  
    void f(String s, int n) {  
        System.out.println("Afsn: "+s+n);  
    }  
  
    void f(int n, String s) {  
        System.out.println("Afns: "+n+s);  
    }  
}
```

```

    }
    void f(int n) { System.out.println("Afn: "+n); }
}
class B extends A {
    void f(int n) { System.out.println("Bfn: " + n); }
    void f(String s, int n) { System.out.println("Bfsn: "+s+n); }
}
class C extends B {
    void f(int n, String s) { System.out.println("Cfns: "+n+s); }
    void f(int n) { f("hello", n); }
}
public class Methods {
    public static void main(String[] args) {
        B b = new B();
        b.f();
        b.f(17);
        A c = new C();
        c.f(" hi ");
        c.f(331);
        c.f(17, " question ");
        c.f(" answer ", 42);
    }
}

```

- F. Extend the code shown below to handle the exception that can occur when opening a file that does not exist. You do not have to add the import that is needed for the exception (2 marks)

```

public void readFile(String filename) {

```

```

    File file = new File(filename);
    Scanner scan = new Scanner(file);

```

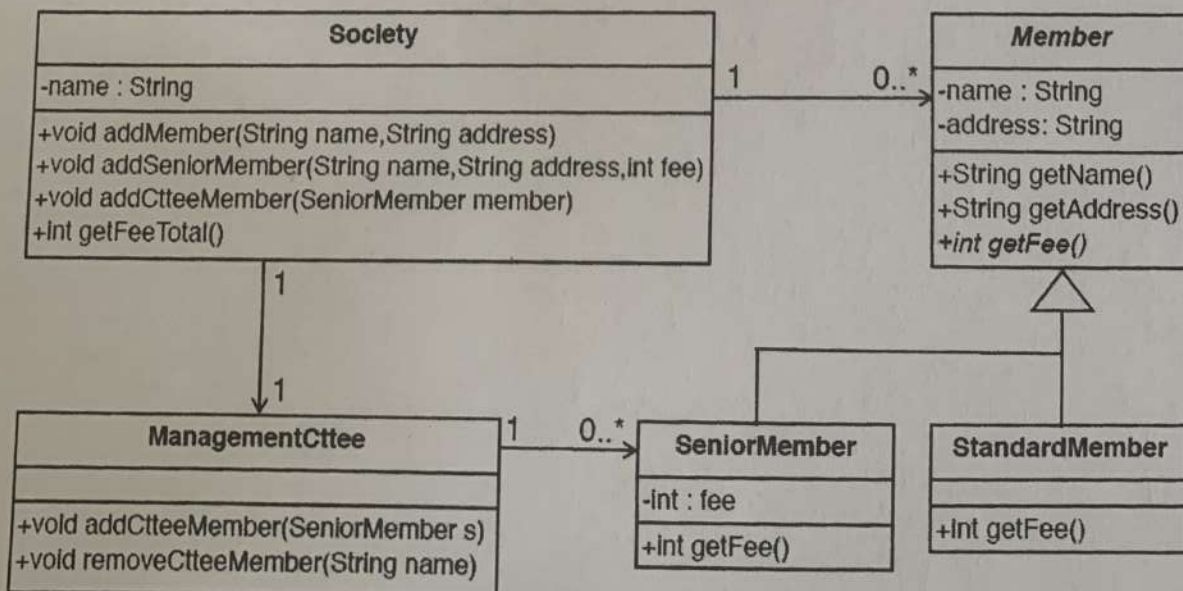
Question 3

A bank maintains two kinds of accounts for customers, one called savings account and the other as current account. The savings account provides interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance. The bank wants to write an application that performs its customer account calculations

- Draw a hierarchical class diagram for the class account based on the above description. (5 marks)
- Create a class account that stores customer name, account number and type of account. (3 marks)
- From this derive the classes currentAccount and savingsAccount to make them more specific to their requirements (4 marks)
- Display the details for 2 current account and one Savings account (2 marks)
- How does inheritance promote software reusability? (2 marks)
- How is multiple inheritances implemented in Java? (4 marks)

Question 4

Consider this UML class diagram showing part of a program to manage the membership information for a professional society:



- a) Write a Java version of class ManagementCttee assuming it has this constructor:
`public ManagementCttee()` (4 marks)
- b) Class Member is an abstract class. Explain the role of an abstract class. (4 marks)
- c) Write a Java version of class Member assuming it has this constructor: `public Member(String name, String address)` and that the method `getFee()` is abstract. (4 marks)
- d) Write a Java version of class StandardMember assuming it has this constructor: `public StandardMember(String name, String address)` and the standard membership fee is fixed at GH50. (4 marks)
- e) Write a Java version of class SeniorMember assuming it has this constructor:
`public SeniorMember(String name, String address, int fee)` where the membership fee is set when a SeniorMember object is created. (4 marks)

