MAKERERE UNIVERSITY
COLLEGE OF COMPUTING & INFORMATION SCIENCES
SCHOOL OF COMPUTING & IT
BSE2107 Object-Oriented Programming II
Test I Sem I 2022-2023

Date: 24th November 2022
Time Allowed: 1 hour
Instructions: Attempt all questions. No marks shall be awarded for definition of the concept. Your reasoning/answering should be based on Java 8 and above.

Question I
For each of the following, indicate TRUE/FALSE and give a reason for your answer. (2 Marks- 0.5 marks for TRUE/FALSE and 1.5 Marks for reason).

a) Interned strings save memory.
b) Objects of a final class cannot change their state.
c) Assuming that K is a subclass of Q, then, the following line of code will cause an error;
   Q obj=new K();
d) Methods of a final class can be overridden as long as the class is public.
e) Once a class is concrete, then, its objects can be cloned.

Question II
Using an example of Java program(s) of your choice, demonstrate how each of the following OOP concepts can be implemented. In each case, show some output.

1. Constructor ~~changing~~ chaining (use inheritance) (5 Marks)
2. Using throw keyword (5 Marks)
3. A class with a generic method (5 Marks)

END
Success dwells where the will of God is known and done!!

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BSE2107 Object-Oriented Programming II
Test II Sem I 2022-2023

Date: 15th December 2022
Time Allowed: 1 hour
Instructions: Attempt all questions. No marks shall be awarded for definition of the concept. Your reasoning/answering should be based on Java 8 and above.

Question I

a) .....is the constructor of an anonymous inner class that implements an interface. (1 Mark)

b) Given that class A has a member inner class B. When A is compiled, the name of the object file for class B is A$B..... (1 Mark)

c) transient..is a keyword used to indicate that a particular field in a serializable class won't be part of the serialized object. (1 Mark)

d) Given that class P has a member inner class Q and both classes P and Q define a method called m(). While inside class Q, if your intension is to call the method m() of outer class P, then, ...is the Java statement used. (3 Marks)

e) Consider InternalProduct to be a non-static member inner class of Product. Suppose you want to instantiate InternalProduct inside another class called X, the Java statement(s) to achieve this is/are..... (4 Marks)

Question II

a) Assume that Product is an interface with an abstract method printAmount() that takes a double and an int and returns nothing. This interface is to be implemented by an anonymous inner class of a class called Sale. When you run Sale class, it should print the amount of a sale made. Assume that in printAmount(), the double is for the price and the int is for quantity sold. You are free to fix/assume these values while calling printAmount(). **Do not define the interface.** (8 Marks)

b) Consider Candidate to be a class whose objects can be serialized. Each candidate has a name, post and votes. Write down a Java program(s) to write a serialized object of Candidate to a file BallotBox.txt. You are free to assume values of the object to be serialized. (7 Marks)

END

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COLLEGE OF COMPUTING & INFORMATION SCIENCES

SCHOOL OF COMPUTING & INFORMATICS TECHNOLOGY

END OF SEMESTER I EXAMINATION 2022/2023

PROGRAMME: SE

YEAR OF STUDY: II

COURSE NAME: Object-Oriented Programming II

COURSE CODE: BSE2107

DATE: 20th January 2023 TIME: 8-11 AM

EXAMINATION INSTRUCTIONS

1. ATTEMPT ALL QUESTIONS IN SECTION A (40 MARKS)
2. ATTEMPT ONLY THREE (03) QUESTIONS IN SECTION B (60 MARKS)
3. DO NOT OPEN THIS EXAM UNTIL YOU ARE TOLD TO DO SO
4. ATTEMPT EACH QUESTION IN SECTION B ON A NEW PAGE
5. ALL ROUGH WORK SHOULD BE IN YOUR ANSWER BOOKLET
6. YOUR ANSWERS SHOULD BE BASED ON JAVA 8 ONWARDS

SECTION A- 40 Marks- (ATTEMPT ALL QUESTIONS)

PART I

For Each of the following questions, write down the most appropriate word or words to fill the blank space provided. Mind case sensitivity of your answer (2 Marks@)

a) ..... is a keyword put on a block of Java code that is likely to cause an exception
b) ..... is a keyword put on a block of code that must execute regardless of whether an exception has occurred or not.
c) ..... is a keyword put on a block of Java code that should be executed when a certain exception occurs.
d) ..... is a keyword put on a class's attribute in a Java program so that that attribute is not serialized during object serialization.
e) ..... is the constructor of an anonymous inner class that implements an interface.
f) ..... takes place at run time when the JVM searches for the invoked method up the inheritance hierarchy through method matching using the method signature.

PART II

For each of the following question, indicate TRUE/FALSE and give a reason for your answer. [3 Marks @ question, 0.5 Marks for TRUE/FALSE and 2.5 Marks for reason]

a) Interfaces allow multiple inheritance in Java.
b) Methods of a final class can be overridden as long as those methods are not final.
c) Objects of a final class can never change their state.
d) Interned strings save memory.

PART III

Write down a Java program or Java programs to demonstrate each of the following Object-Oriented Programming Concepts. Your program should provide some output and you should write down this output. NO MARK awarded for defining the concept.

a) Constructor chaining (you must use inheritance) (6 Marks)
b) Object immutability (5 Marks)
c) Using throw keyword (5 Marks)

SECTION B (ATTEMPT ONLY THREE QUESTIONS)

Question One

a) Given that A is a subclass of B, does the following code cause an error? Indicate YES or NO and give a reason. [3 Marks-0.5 Marks for YES or NO, 2.5 for reason]
   i) A obj1=new B();
   ii) A obj2=(A) new B();

b) Using an example of your choice using Java, demonstrate the concept of object cloning. (8 Marks)
c) Under what circumstance would you opt to use an interface instead of a class in system design? (2 Marks)
d) When implementing polymorphism with classes and interfaces, there are two inconsistences that one should be aware of and if possible, avoid them. Mention these two inconsistences (4 Marks)

Question Two

a) Distinguish between checked and unchecked exceptions. (3 Marks)
b) Using an example of your choice, write a Java program that creates a user-defined exception. Your exception should print a message when it occurs. (5 Marks)
c) Write a Java program that checks for the exception defined in b) above. (7 Marks)
d) Using an example of your choice, write a Java program that uses a try-with-resources. (5 Marks)

Question Three

a) State one advantage of serializing objects in an object-oriented program. (2 Marks)
b) How is object serialization better than object cloning? (2 Marks)
c) Consider Trader to be a class whose objects can be serialized. Each Trader has a TraderID(text), name(text) and location(text). Write down a Java program(s) to write a serialized object of Trader to a file traders.txt. You are to assume values of the object's attributes to be serialized. (9 Marks)
d) Write a Java program that can deserialize the object written in traders.txt in c) above and print the output on screen. (7 Marks)

Question Four

a) Consider B to be an outer class with a non-static inner class A. Assume that both A and B contain an instance method m() with same signature. If your intention is to call method m() of class B inside inner class A, write down one Java statement to achieve this. (2 Marks)
b) P and Q are two public classes in the same package and P contains a static inner class A and a non-static inner class B. Write down a statement (or a set of statements) to;
   i) Create x as an object of A inside class Q (3 Marks)
   ii) Create y as an object of B inside class Q (4 Marks)
c) Define Business as an interface with an abstract method payLicense() that takes an integer and returns nothing. (3 Marks)
d) Define a class Retail that has an anonymous inner class that implements the interface Business in c) above. The class Retail should call the payLicense() method which takes the amount to be paid and prints it on the screen. (8 Marks)

Question Five

a) Explain how you understand the following terms in JDBC (1 Mark @)
   i. DriverManager class
   ii. executeBatch method
   iii. PreparedStatement interface
b) With code snippets, explain three method signatures for a 'getConnection' method used in database URL formulation in JDBC. (6 Marks)
c) Describe the four steps involved in establishing a JDBC connection. (4 Marks)
d) Paul, a software engineering student, wrote a JDBC application that accepts studentId at runtime and returns student details i.e firstName, lastName and age from students table in the database called school.
   i. Which statement interface could Paul have used to return student information, and why? (2 Marks)
   ii. Write Java code fragments demonstrating how Paul established connection, captured and passed studentId into a SQL query to return student-specific information. (5 Marks)

END

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