Department of Computer Science & Engineering
University of Asia Pacific (UAP)

Final Examination **Fall 2019** **3rd Year 1st Semester**

Course Code: CSE 309 **Course Title: Object Oriented Programming II: Visual and Web Programming** **Credits: 3**

Full Marks: 150 **Duration: 3 Hours**

Instructions:

- There are **Six (6)** Questions. All questions are of equal value. Part marks are shown in the margins.
- Non-programmable calculators are allowed.

1. Let us imagine a scenario where you need to develop a management system for Ultimate Bank Ltd. At first, you want to implement the Debit Card system in the bank. A debit card has 'withdraw', 'deposit', and 'check balance' functionalities. You want to design the bank management system with object-oriented programming concepts.
Now answer the following questions:

   a. What is object-oriented programming? [3]
   b. Identify possible class, interface, and abstract class from the above scenario with proper reasoning. [4+4+4]
   c. Write the code of the interface and abstract class you identified in question no 1-b. [5+5]

2. Let's say you want to design a university management system where you have to keep records of courses, students, and teachers. There is an admin who can manage all the records of courses and students. [10+5+10]

   i. Draw an ER diagram based on the description.
   ii. Draw a table/schema diagram from the ERD.
   iii. Now implement models in Django.

3. a. What is inheritance? Draw the diagrams (with proper arrow direction) of different types of inheritance. [3+7]

   b. Give an example scenario (draw a diagram) to demonstrate hybrid inheritance. [5]
   c. Implement the classes from the answer of 4-b where every class should have at least one attribute and one method. [10]

4. a. A python function is given in the below
def simpleFun(voltage=20, state='a stiff', action='voom', type=' Blue')

   Now identify correct and incorrect statements.
   i. ***simpleFun*** (voltage=1000)
   ii. ***simpleFun*** (voltage=5.0, 'dead')
   iii. ***simpleFun*** (actor='John Cleese')
   iv. ***simpleFun*** (voltage=1000000, action='VOOOOOM')
   v. ***simpleFun*** ('a thousand', state='pushing up the daisies')
   vi. ***simpleFun*** ('a million', 'bereft of life', 'jump')
   vii. ***simpleFun*** (110, voltage=220)
   viii. ***simpleFun*** (1000)
   ix. ***simpleFun*** (action='VOOOOOM', voltage=1000000)
   x. ***simpleFun*** ()

b. Write a python function which generates and returns a list of prime numbers for a given range. The function takes starting and ending numbers of the range as parameters.

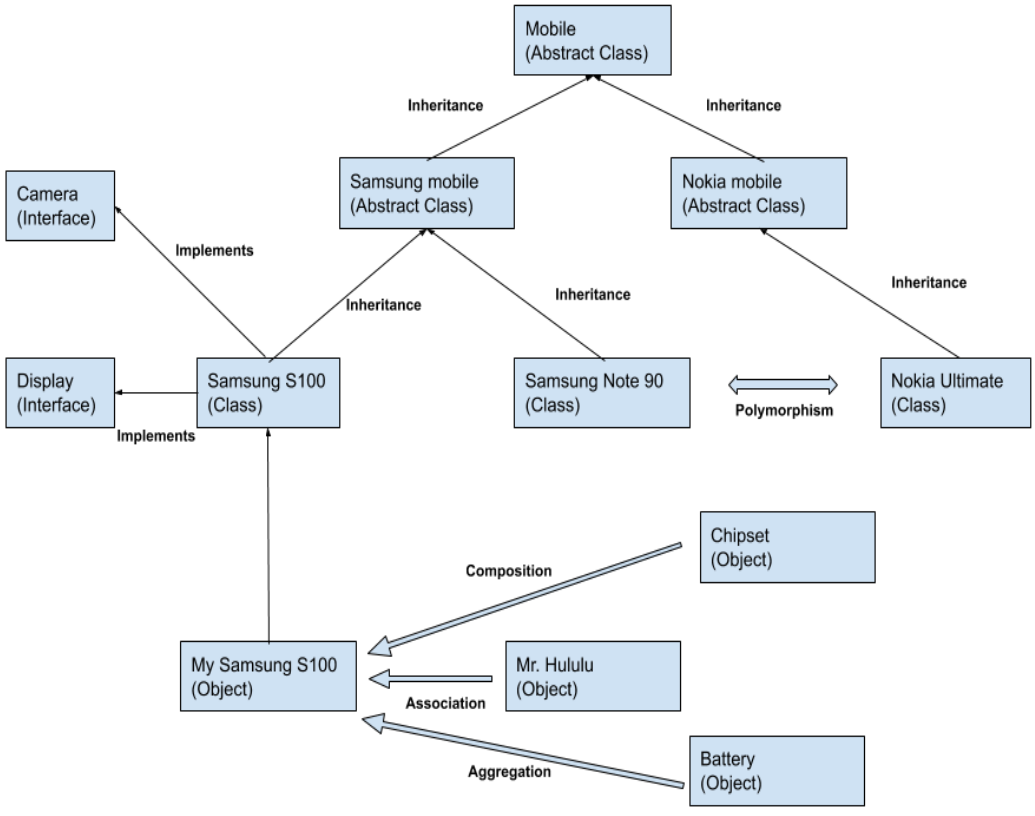
OR

a. Which of the following python statements are going to generate error? Explain the reason briefly. [5x2=10]

I. a=”Picture”
a[0]=”V”
II. x=[1, 2, 3, 4]
x[0] = 100
III. x=[1, 2, 3, 4]
print(x[100])
IV. x=[1, 2, 3, 4]
print(x[100:])
V. x=[1, 2, 3, 4]
print(x[:100])

b. Write a python function that generates and returns a list of Fibonacci numbers for a given range. The function takes starting and ending numbers of the range as parameters. [15]

5.



All the classes have ‘abstraction’ and ‘encapsulation’ properties

The above scenario shows all the features of object-oriented programming. Now design another similar scenario where all object-oriented programming features can be represented. [25]

6. You want to create a library management system. At any point, first, you want to implement "search book" functionality in the "book list" page. The book list pages have a search bar for writing book names. When a user writes the name of a book, the system searches the database and shows the result. Now write the necessary codes in the following files to implement the "search book" operation. [5+5+10+5]

I. Url.py
II. Model.py
III. Views.py
IV. booklist.html

OR

You want to create a library management system. At first, you want to implement an "insert book" functionality. A book has a book name, author, publication date, and price. Now write codes in the following files to implement the 'Insert book' function. [5+5+10+5]

I. Url.py
II. Model.py
III. Views.py
IV. insertbook.html