ADEKUNLE AJASIN UNIVERSITY, AKUNGBA-AKOKO
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
1st SEMESTER EXAMINATION – 2013/2014 SESSION

Course Title: Computer Programming II (JAVA) **Course Code:** CSC 305
Course Unit: 3 **Course Status:** Core **Time:** 2½ hours
Instruction: Answer **Question 1** and any other **two (2) questions**

1a. What are Control Statements in JAVA? (2mks)

b. With detailed program illustration, explain the following Iterative Control Statements:
i. While ii. Do-While iii. FOR (3mks)

c. Explain 'Array' in JAVA. (2mks)

d. Given two 2-dimensional arrays, MyMatrixA containing w rows and x columns of elements, and MyMatrixB, containing y rows and z columns, write a JAVA program that carries out multiplication operations on the two matrices to generate MyMatrixC.(3mks)

e. Draw an inheritance hierarchy for students at AAUA. Use STUDENT as the superclass of the hierarchy, and then extend STUDENT with classes UNDERGRADUATE, POSTGRADUATE, and GRADUATE. Continue to extend the hierarchies as deep as possible. (6mks)

f. Discuss the relationship that exists in the hierarchies(in **e**) in terms of superclass and subclass. (2mks)

g. Programmatically represent the inheritance hierarchy classes. (3mks)

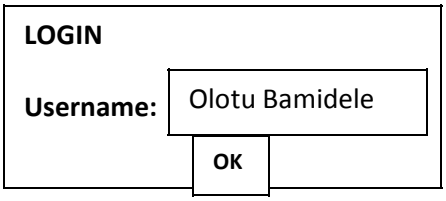
h. In a typical PUTME Examination, it is believed that students from different classes of studies (e.g. **SCIENCE, ARTS & COMMERCIAL classes)** partake in such an examination. It is also expected that such classes of students are given different examination requirements. For instance:

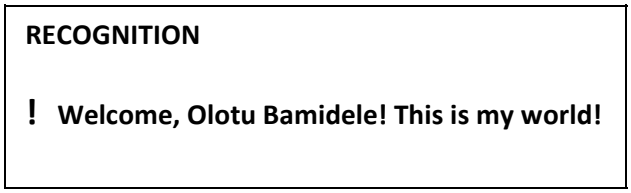
SCIENCE	**ARTS**	**COMMERCIAL**
1. You are permitted to come with calculator and pencil. 2. You will be taking 5 exams. 3. For you, Mathematics is compulsory regardless of your chosen course.	1. You are not permitted to come with calculator and pencil. 2. You will be taking 3 exams. 3. For you, Literature is compulsory regardless of your chosen course.	1. You are permitted to come with your calculator and pencil. 2. You will be taking 4 exams. 3. For you, Government is compulsory regardless of your chosen course.

Write a Java **GUI SWITCH-CASE CLASS** program that prompts a student to input his/her class of studies (e.g. science, arts or commercial), then capture and output the appropriate examination requirement for such student. (9mks)

2a. The game of LUDO is designed to be played by four (4). Design a JAVA Application using random facility available to allow for the game to be played three (3) times by four (4) different people. For each game however, we want to capture the winner by recording the values thrown. So, in your coding, allow the values of the dice thrown by each player to be recorded for them. From the scores recorded, sum all the values thrown by each player against their id and then compare to know which of the four (4) players has the highest figure thrown after three (3) rounds of play; consequently, adjudge the person to be the winner (e.g. ***PLAYER 1 is the WINNER! ACCEPT MY CONGRATULATIONS!!HURRAY!!!***). *(15mks)*

b. Develop a **USER RECOGNITION App** that identifies user that log in to your application. The application should accept user's name while logging in, then prompt back to the user with the login name, proving the recognition of his entrance. (5mks)



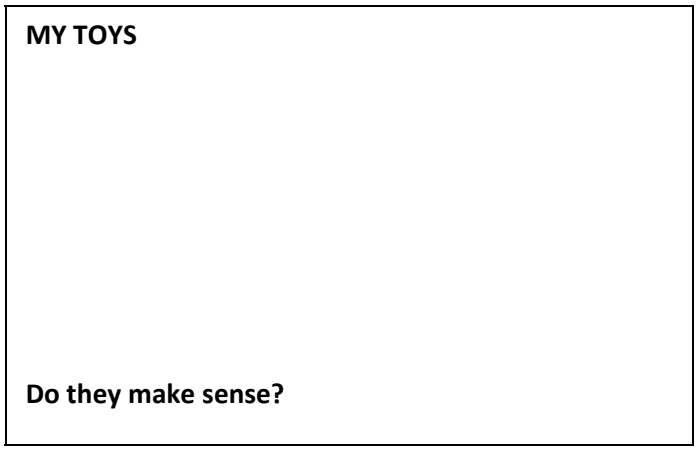


3a. Factorial is a common and popular programming exercise. Bringing in your knowledge of writing java programs in classes, code to computer for (i)factorial of n (ii) combination of m and n (iii) permutation of m and n; assuming m and n to be positive integers whose values are greater than 0.
(9mks)

b. Fabonacii is a number that has two values as initials, e.g. 0, 1; then add up the previous two digits to give the next number and ditto subsequent numbers.
0, 1, 1, 2, 3, 5, 8, 13, ... Write a java program to implement the next 50 series.
(11mks)

4a. Weeks back, you partook in the CBT Exams on GST and ENT. Assuming for the examinations (GST & ENT), each candidate answered 35 questions (each from both GST & ENT) before leaving the exam hall. Now, these questions are logically and randomly pooled from a question bank. Assuming there are 300 questions in each pool of GST & ENT Questions, and taking this class with a population of 200 students as case study, write a JAVA program that pools questions randomly for a student the stated student/sampled population for both GST & ENT Exams, answering 35questions from each subject.
(10mks)

b. Using JAVA Graphics/Drawing facility, do a little play around with the diagram/sketch below:



Given the following :

i. Circle: Red Outline, 23, 25, 56, 63
ii. Square: Blue Fill, 27, 28, 58 73
iii. Rectangle: Cyan Outline, 23 26, 55, 59

iv. Polygon: Magenta Fill, 31, 36, 67
v. Text: Yellow, 45, 51, 67, 73

(10mks)