MUEO

MOI UNIVERSITY

OFFICE OF THE DEPUTY VICE CHANCELLOR
(ACADEMICS, RESEARCH & EXTENSION)

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATION

FOR THE DEGREE OF
BACHELOR OF ENGINEERING
IN
ELECTRICAL & TELECOMMUNICATIONS ENGINEERING
ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE CODE: COE 301

COURSE TITLE: COMPUTER PROGRAMMING

DATE: 1ST MARCH, 2018 **TIME:** 9.00 A.M. – 12.00 NOON

INSTRUCTION TO CANDIDATES

- ANSWER ANY FIVE QUESTIONS
- ALL QUESTIONS ARE 14 MARKS EACH

THIS PAPER CONSISTS OF (5) PRINTED PAGES

PLEASE TURN OVER

ANSWER ANY FIVE QUESTIONS

QUESTION ONE (1)

a. **(Credit Limit Calculator)**

Develop a java application that determines whether any of several departments –store customers has exceeded the credit limit on a charge account. For each customer, the following facts are available

i. account number
ii. balance at the beginning of the month
iii. totals of all items charged by the customer this month
iv. total of all credits applied to the customer's account this month
v. allowed credit limit

The programs should input all these facts as integers, calculate the **new balance = (beginning balance+ charges-credit)**, display the new balance and determine whether the new balance exceeds the customer's credit limit. For those customers whose credit limit is exceeded, the program should display the message "**credit limit exceeded**". The program should be able to compute for several customers and terminate only when terminating value entered into the program (8 mks)

b. Write a java application that implements the following decisions table using a nested statement. Assume that the grade point average is within range 0.0 through 4.0. The program should allow a display of different student output values for different grade point average input.(6 mks)

Grade point average	Transcript message
0.0-0.99	Failed semester registration suspended
1.0-1.99	On probation for next semester
2.0-2.99	No message
3.0-3.49	Dean's list for semester
3.5-4.0	Highest honors for semester

QUESTION TWO (2)

a. What are unique advantages of an object oriented programming paradigm? (2mks)

b. List areas of application of an object oriented technology.(2mks)
c. State and discuss the six stages of PDLC (6mks).
d. What does the following program segment do?

```
For (i= 1; i<= 5; i++)
{
    For (j=1; j<=3; j++)
    {
    For (k=1; k<=4; k+=)
    System.out.printIn ('*');
    System.out.printIn ();
    }//end inner  for loop
    System.out.printIn ();
    }//end outer for loop
```

(4mks)

QUESTION THREE (3)

a. Develop a java application that determines the gross pay for each of three employees. The company pays straight time for the first 40hours worked by each employee and time and a half for all hours worked in excess 40. You're given a list of employees, their number of hours worked last week and their hourly rates. Your program should input this information for each employee, then determine and display the employee's gross pay. Use class scanner to input data(6 mks)

b. Describe the four basic elements of counter-controlled repetition. (2mks)
c. Compare and contrast the while for repetition statements. (2mks)
d. Discuss a situation in which it would be more appropriate to use a Do...While statement than a while statement explain why. (2mks)
e. Compare and contrast the break and continue statements. (2mks)

QUESTION FOUR (4)

a) Write a java application to solve a quadratic equations of the form

$$AX^2+BX+C=0$$

Where the co-efficients A, B and C are real numbers. The two real numbers solutions are derived by the formula $x = \frac{-B+\sqrt{(B^2-4AC)}}{2A}$

The programme should allow the user to input different values A, B and C and display both real and complex solutions. (7mks)

b) Differentiate between access modifier and method modifier(2mks)

c) Distinguish between the following types of translators as used in the computer system.
   i. Compilers
   ii. Interpreters
   iii. Assemblers
   (3 mks)

d) Discus the role played by programming in problem solving. (2mks)

QUESTION FIVE (5)

a. Write a java application that calculates the average of the EVEN integers from 1 to 100.use a while statement to loop through the calculation and increment statements. The loop should terminate when the value of x becomes 101. (6 mks)

b. Use a for-loop in solving above the problem.(4mks)

c. Write a java application program that displays the sum of the first ten odd natural numbers squares (e.g. $1^2 + 3^2 + 5^2 + 7^2$...) (4mks)

QUESTION SIX (6)

a. Distinguish between the following terms
   i. Inheritance and polymorphism
   ii. Data abstraction and data encapsulation
   iii. Classes and objects (6mks)

b. State why variables must be declared before they are used in a program,(2 mks)

c. Discuss the ways in which inheritance promotes software reuse, saves times during program development and helps prevent errors.(4mks)

d. Define each of the following errors

i. Syntax error
ii. Logical error (2mks)

QUESTION SEVEN (7)

a. Testing forms an integral part in program development. Discus the reasons that justify why testing is critical before any product is delivered to the user. (3mks)
b. How are arrays of objects implemented in the program? Use a programming example to illustrate. (3mks)
c. Exception handling mechanism is introduced in the object oriented programming. Explain its role in program development. Use a program to support your answer. (4mks)
d. A java program is required to initialize , display and arrange the elements of an array is ascending order. Write a class oriented program to implement the process. (4mks)