



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

P.O. Box 62157
00200 Nairobi - KENYA
Telephone: 891601-6
Fax: 254-20-891084
E-mail: academics@cuea.edu

AUGUST - DECEMBER 2015 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

REGULAR PROGRAMME

CMT 204: OBJECT ORIENTED PROGRAMMING I LAB

Date: DECEMBER 2015

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and ANY other TWO Questions

Q1. An upcoming matatu company wishes to come up with a console based application which meets the following specifications. The application should display the following menu to its users

Digital matatu chap chap

1. Register customer
2. Pay fare
3. Print receipt
4. Exit

Based on the section users make from the keyboard the program should execute the relevant function.

Option one should call a relevant function which accepts customer details such as name, ID No. , gender Tel No., and postal address.

Option two should call a relevant function which accepts the route name a customer wishes to travel to. Based on route entered the program should display the fare for that route. The program should the prompt the customer to enter amount.

Option three should make use of a friend function to print a receipt for the customer.

Option four should force the program to terminate.

Additional information

The menu should keep on iterating provided key 1 – 3 have been pressed from the keyboard.

Use the concepts of classes and objects to implement the program.

The function for option two should be declared in a separate base class but implemented in the same class with others.

- Q2. Keroche Industries Ltd use the following Pay As You Earn (P.A.Y.E) for all its employees salary categories.

| Category | Gross salary (kshs) | P.A.Y.E |
|----------|----------------------|---------|
| 1 | 0 _____ 10,000 | 10% |
| 2 | 10,001 _____ 30,000 | 12% |
| 3 | 30,001 _____ 100,000 | 25% |
| 4 | Above 100,000 | 30% |
| | | |

You are required to write a C++ program to automate the operations of Keroche. The program should first provide the following menu to their users.

Keroche Employee App

1. Register Employee
2. Overtime hours
3. Payslip
- 4.

If option one is selected the program should call a function known as register EMP () the function shall accept details related to employee ie name, employee number, position, telephone number, postal address. The position should be passed to another function known a employeesalary () which determines the employeebasic salary, housing allowance and travelling allowance. The three should be aggregated together to get gross salary.

If option two is seleted from the keyboard the program should call a function known as overtime () which prompts the user to enter overtime hours worked. Each overtime hours should be charged at ksh 2,000.00

Option three shold call a function known as payslip () which display a payslip for the employee.

Additional information

Program should use the concept of classes and objects to implement the program.

The program should include an additional function known as paye which accepts the employee gross salary and returns the paye amount.

The net income of the employee is calculated as follows
Net = [Gross salary + overtime] – [paye + NHIF + NSSF]
NHIF = 320.00
NSSF = 200.00

- Q3. Write a C++ program that includes a base class known as a person. The class should define three functions i.e. accept, grading () and display functions which shall be inherited by another child class known as student. The class should define inheritable class fields for a student object i.e. name, registration number, gender and course they are doing, unit name and marks for that unit. The program should accept the mark of a student and return the corresponding grade. Display () should display a transcript for all students.

Additional information

Invalid marks should not be processed by the grading function.
Program should capture details of n students
Use concepts of classes to implement the above.

END