Vavuniya Campus of the University of Jaffna

First Examination in Information Communication Technology - 2016 (Technology Stream)

Second Semester - November/December 2017

TICT1234 - Object Oriented Programming (Practical)

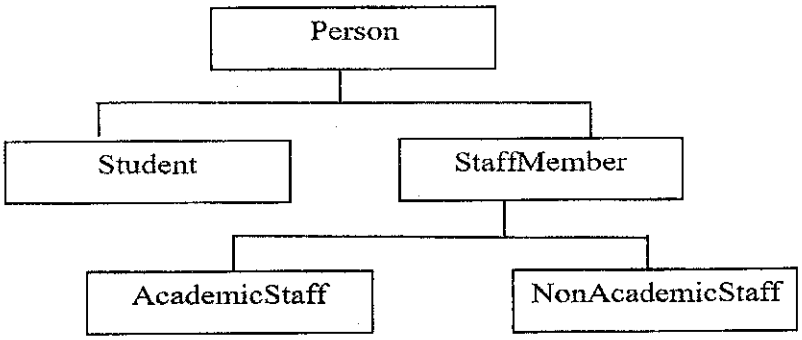
Answer All Questions

Time Allowed: Three hours

Instructions:

Create a folder in the desktop with your Index number (For example: TS1001) and save all your files in the folder.

1. Consider the following diagram and answer the questions given below.



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(a) Write a Java class **Person** which has the following properties.

i. Attributes(private):

- String name
- String nic
- int age

ii. Constructor:

- Person (String name, String nic, int age)

iii. Methods(public):

- void print(): *To print a particular person's details*

(b) Write a Java class **Student** which has the following properties.

i. Attributes(private):

- double gpa1
- double gpa2
- double gpa3
- double gpa4
- double finalgpa
- String result

ii. Constructor:

- Student (String name, String nic, int age, double gpa1, double gpa2, double gpa3, double gpa4)

iii. Methods(public):

- double calculateFinalGpa(): *To calculate the Final GPA*
- String getFinalResult(): *To get the Final Result according to the Final GPA*

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Note:

- To calculate the Final GPA, use the following formula.

  Final GPA=(gpa1+gpa2+gpa3+gpa4)/4

- Use the following table to get the Final Result according to the Final GPA.

Final GPA	**Result**
GPA $\geq$ 3.70	First Class
3.30 $\leq$ GPA $<$ 3.70	Second Class(Upper Division)
3.00 $\leq$ GPA $<$ 3.30	Second Class(Lower Division)
GPA $<$ 3.00	Pass

(c) Write a Java class **StaffMember** which has the following properties.

i. Attributes:

- double basicsalary
- final double allowance
- double loaninstallment

ii. Constructor:

- StaffMember (String name, String nic, int age, double basicsalary, double loaninstallment)

iii. Methods(public):

- double getSalary(): *Abstract method*

(d) Write a Java class **AcademicStaff** which has the following properties.

i. Attributes:

- final double academicallowance

ii. Constructor:

- AcademicStaff (String name, String nic, int age, double basicsalary, double loaninstallment)

iii. Methods(public):

- double getSalary(): *To get the Total Salary of the academic staff*

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Note:

- Use the following formula to calculate the Total Salary of the academic staff.

  *Total Salary = Basic Salary + Allowance + (Basic Salary/100)*Academic Allowance - Loan Installment*

(e) Write a Java class **NonAcademicStaff** which has the following properties.

i. Attributes(private):

- double overtimehours
- double overtimepayment

ii. Constructor:

- NonAcademicStaff (String name, String nic, int age, double basicsalary, double loaninstallment, double overtimehours)

iii. Methods(public):

- double overtimeAmount(): *To calculate the payment for the overtime*
- double getSalary(): *To get the Total Salary of the non academic staff*

Note:

- To calculate the Over Time Payment for the non academic staff, use the following formula.

  *Over Time Payment=(Basic Salary/(20*8))*Overtime Hours*

- Use the following formula to calculate the Total Salary of the non academic staff.

  Total Salary = Basic Salary + Allowance + Over Time Payment - Loan Installment

(f) Write the constructors of super classes within the constructors of derived classes by considering the given diagram.

(g) Add the attribute *allowance* (as a constant and initialize it as 7800.00) within the *StaffMember* class.

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