POKHARA UNIVERSITY

Level: Bachelor   Semester: Fall   Year   : 2015
Programme: BE   Full Marks: 100
Course: Object Oriented Programming in C++   Pass Marks: 45
                                                       Time   : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) How does making use of abstractions help in designing of an Object Oriented System? Explain with an example. — 7

   b) What is the role of behaviour in OOP? Along with a figure and an example of a CRC card, explain its significance in Object Oriented Design. — 8

2. a) What is an inline function? Explain its importance with the help of an example program. — 7

   b) How do we make use of a Virtual Destructor when we need to make sure that the different destructors in an inheritance chain are called in order? Explain with an example in C++. — 7

3. a) Create classes called class1 and class2 with each of having one private member. Add member function to set a value (say setvalue) on each class. Add one more function max () that is friendly to both classes. max () function should compare two private member of two classes and show maximum among them. Create one-one object of each class then set a value on them. Display the maximum number among them. — 8

   b) Explain how Inheritance Support Reusability? Describe the syntax of multiple and multilevel inheritance? — 7

4. a) Compare and contrast composition and inheritance. — 5

   b) Differentiate between is-a and has-a rule with suitable example. — 5

   c) Write a program to enter the information of n students and then display it using the concept of multilevel inheritance. — 5

5. a) What is the benefit of overloading an operator? Design a Soccer — 8

1

Player class that includes three integer fields: a player's jersey number, number of goals, number of assists and necessary constructors to initialize the data members. Overload the > operator (greater than). One player is considered greater than another if the sum of goals plus assists is greater than that of the others. Create an array of 11 soccer players, then use the overloaded > operator to find the player who has the greatest total of goals plus assists.

b) How can you achieve run time polymorphism in C++? Discuss with a suitable example.   7

6. a) Define a class called stack and implement generic methods to push and pop the elements from the stack.   8

b) **Path-follower Robot:**   7

A Path-follower Robot senses the path it needs to follow thru its sensors. Based on the data received thru its sensors, the Robot makes use of its actuators (Robotic Wheels) to steer itself forward. For the above mentioned system, identify as many components (collaborating objects) as you can, draw CRC card for at least three of them and show the interaction between these components thru an interaction diagram.

7. Write short notes on: (**Any two**)   2×5
   a) Responsibility Driven Design.
   b) Stack versus Heap Based Allocation.
   c) Virtual functions.

POKHARA UNIVERSITY

Level: Bachelor   Semester – Fall   Year   : 2012
Programme: BE   Full Marks: 100
Course: Object Oriented Programming in C++   Pass Marks: 45
   Time   : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define classes and objects? How does a class accomplish data encapsulation?   8

    b) What are the important characteristics of object oriented programming? Differentiate between procedural programming and modular programming?   7

2. a) What are different aspects of software components?   7

    b) Insulation of data from direct access by the program is called data hiding. Support this statement with an example.   8

3. a) What is dynamic memory allocation? How do you allocate memory dynamically in C++? Explain with an example?   8

    b) Explain the purpose of constructor and destructor. Describe their significances. Can we have more than one destructor in a class? Explain it.   7

4. a) Write a program that will represent angular measurement in degree with OOPs approach. The program should have conversion functions to convert radian and gradient measurement.(Apply class to class conversion)   8

    b) How ambiguity occurs in multiple inheritances? Explain with an example how ambiguity can be resolved?   7

5. a) An Education institute wishes to maintain a database of its   8

employees. The database is divided into a number of classes whose hierarchical relationships are shown in figure. The figure also shows the minimum information required for each class. Specify all the classes and define functions to create the database and retrieve individual information as an when required.
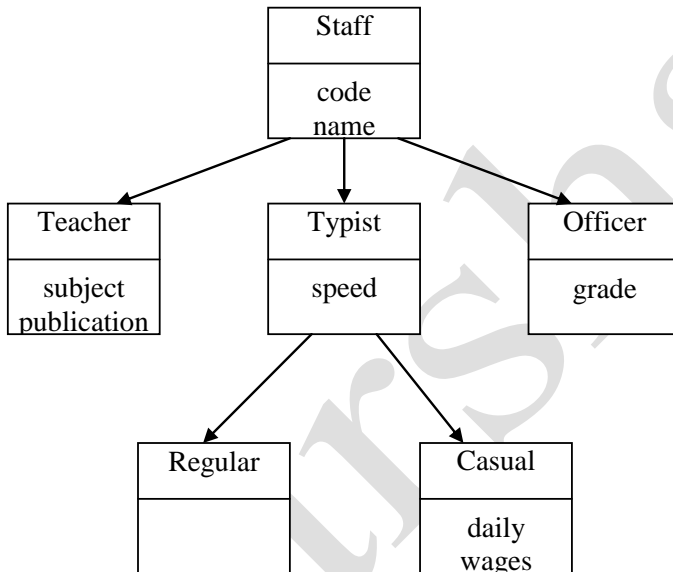
b) What is containership? How does it differ from inheritance?

7

6. a) "Functions and objects associated with each other at runtime is known as runtime polymorphism." Support or oppose this statement with an example.

8

b) What is Generic programming? Write a function template to calculate the sum and average of numbers.

7

7. Write short notes on **any two:**

2×5

a) CRC cards

b) Inline function

c) The is – a relationship

2

POKHARA UNIVERSITY

Level: Bachelor	Semester – Fall	Year	: 2005
Programme: BE		Full Marks: 100	
Course: Object Oriented Programming		Time	: 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Why OOP is known as a new paradigm? Illustrate with certain examples.   8

   b) What is memory recovery? How does stack differ from heap memory allocation.   7

2. a) What is a class? Explain the different types of classes.   2+6

   b) Create a class called Employee with three data members (empno, name, address), a function called readdata() to take in the details of the employee from the user, and a function called displaydata() to display the details of the employee. In main, create two objects of the class Employee and for each object call the readdata() and the displaydata() functions.   7

3. a) What does contructor mean? Explain the different types of constructors with a suitable example.   7

   b) Write a program using only constructor to find the area of a square and rectangle. Also initialize the object dynamically.   8

4. a) What is polymorphism? Differentiate between compile time and run time polymorphism with program in each.   9

   b) What is hybrid inheritance? Does ambiguity occurs in this type of in this type of inheritance? If yes explain it.   6

5. a) What is operator overloading? Write a program to overload the arithmetic operators $(+, -, *, /)$.   8

   b) Define two classes named 'Polar' and 'Rectangle' to represent points in polar and rectangle systems. Use conversion routines to convert from one system to another system.   7

6. a) Write a program using template to add two integers; two floats and one integer and one float numbers respectively. Display the final result in float.   10

   b) What is exception handling? Discuss briefly.   5

7. *Write short notes on (Any Two)*
   a) CRC Cards

b) Container Classes
c) Friend Function
d) Software Reusability

POKHARA UNIVERSITY

|		
Level: Bachelor	Semester – Fall	Year : 2011
Programme: BE		Full Marks: 100
Course: Object Oriented Programming in C++		Pass Marks: 45
		Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is object oriented programming? How is it different from procedure–oriented programming? 8

   b) What do you mean by software maintenance? Describe the activities falls under it. 7

2. a) Define software component. Discuss about the integration of components with real world example. 8

   b) Define constructor. Describe all types of constructor with suitable example. 7

3. a) Create classes called class1 and class2 with each of having one private member. Add member function to set a value (say setvalue) on each class. Add one more function max () that is friendly to both classes. max() function should compare two private member of two classes and show maximum among them. Create one-one object of each class then set a value on them. Display the maximum number among them. 8

   b) What is the purpose of using access specifier? Describe all access specifier available in c++. 7

4. a) What are the forms of inheritance? Describe them briefly. 7

   b) Implement the following hierarchy: 8
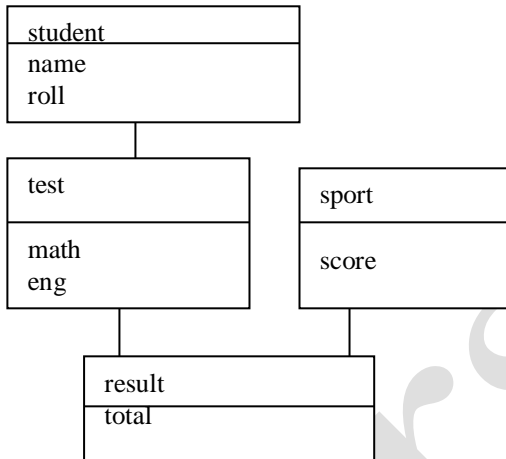
Assume necessary functions yourself.

5. a) What do you mean by virtual base class? At which condition it has to be implemented? Explain it with suitable example.   8

   b) Define operator overloading. Write a program to add two complex number by overloading + operator.   7

6. a) Create a template function swap () and use it to swap two characters, two integer, and two floating point data.   6

   b) Differentiate early binding and late binding with suitable example.   9

7. Write short notes on **any two:**   2×5

   a) Comparing programming in small and programming in large

   b) Message passing versus procedure call

   c) Exception handling

POKHARA UNIVERSITY

Level: Bachelor   Semester – Fall   Year   : 2011
Programme: BE   Full Marks: 100
Course: Object Oriented Programming in C++   Pass Marks: 45
   Time   : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) How object oriented programming is different from procedure oriented programming? 7

   b) Explain the terms: 8

       i.   Reusable Software

       ii.   Coping with complexity

2. a) What do you mean by responsibility driven design? What is CRC Card? 7

   b) Create a class called Mountain with data members name, height, location, a constructor that initializes the members to the values passed to it as parameters, a function called CmpHeight() to compare two objects and DisplayInf() to display the information of Mountain. In main, create two objects of the class mountain and print the information of the mountain which is of greatest height. 8

3. a) What is friend function? How a function can be friendly to two classes? Explain it with suitable example. 8

   b) Explain Message Passing Formalism with syntax in C++. What is stack versus heap memory allocation? 7

4. a) Write a program to overload + operators such that two objects of a complex class can be added. 8

   b) What is protected derivation? How many ways we can access the private and protected members of a class. Explain. 7

5. a) What do you mean by dynamic constructor? Explain with example. 7

1

b)   8
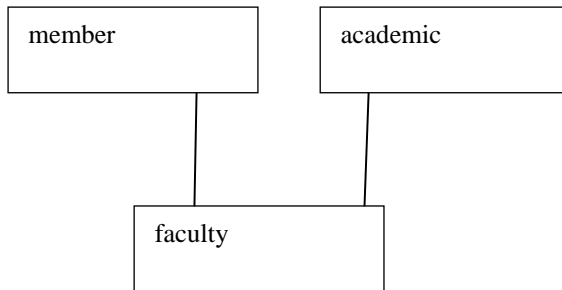
Write necessary constructors and display function in each of the class. Assume the member variables on your own.

6. a) What is generic and templates. Create a template to find the sum of two integers and floats.   7

    b) Write a C++ program to calculate the factorial of a number using recursion.   8

7. Write short notes on **any two:**   2×5

    a) Interface and implementation

    b) Pure polymorphism

    c) Role of behaviour in object oriented programming

POKHARA UNIVERSITY

Level: Bachelor   Semester: Fall   Year   : 2013
Programme: BE   Full Marks: 100
Course: Object Oriented Programming in C++   Pass Marks: 45
                                                  Time   : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What are the main features of object oriented programming? Declare a C++ structure (Program) to contain the following piece of information about cars on a used car lot: 8
     i.   The manufacturer of the car.
     ii.   Model name of the car.
     iii. The asking price for the car.
     iv.   The numbers of miles on odometer.

   b) What are the mechanism of data abstraction? Explain difference between structured and OO programming approach.   7

2. a) Create a class **Person** with data member *Name, age, address* and *citizenship number.* Write a constructor to initialize the value of a person. Assign citizenship number if the age of the person is greater than 16 otherwise assign value zero to citizenship number. Also create a function to display the values.   8

   b) What do you mean by static data member of a class? Explain the characteristics of a static data member.   7

3. a) Explain and contrast memory recovery, stack and heap with a suitable example.   8

   b) During the time of hybrid inheritance when there is hierarchical inheritance at the upper level and multiple inheritance at lower level, ambiguity occurs due to the duplication of data from multiple path at the grand child class. How this kind of ambiguity is resolved? Explain with suitable example.   7

4. a) Write a program to add two complex numbers using binary operator overloading.   8

1

b) What is the difference between static binding and runtime binding? Explain with a suitable code. 7

5. a) What is template ? List the merit and demerit of using a template in c++. Define two classes named 'polar' and 'rectangle' to represent points in polar and rectangle systems. Use conversion routines to convert from one system to another system using template. 8

b) What is containership? How does it differ from inheritance, describe how an object of a class that contain objects of other classes are created. 7

6. a) Explain in brief about interface and implementation. How different components of designed Software can be represented and integrated? Discuss in brief. 8

b) Do 'derivation' and 'friendship' mean the same? What are the similarities and differences between two. 7

7. Write short notes on: (Any two) 2×5
   a) Dynamic Constructor.
   b) Virtual Destructor.
   c) CRC Cards.

POKHARA UNIVERSITY

Level: Bachelor   Semester: Fall   Year   : 2013
Programme: BE   Full Marks: 100
Course: Object Oriented Programming in C++   Pass Marks: 45
                                                  Time   : 3hrs.

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   b) What do you mean by static data member of a class? Explain the characteristics of a static data member.   7

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   b) During the time of hybrid inheritance when there is hierarchical inheritance at the upper level and multiple inheritance at lower level, ambiguity occurs due to the duplication of data from multiple path at the grand child class. How this kind of ambiguity is resolved? Explain with suitable example.   7

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b) Do 'derivation' and 'friendship' mean the same? What are the similarities and differences between two. 7

7. Write short notes on: (Any two) 2×5
    a) Dynamic Constructor.
    b) Virtual Destructor.
    c) CRC Cards.

POKHARA UNIVERSITY

Level: Bachelor   Semester: Spring   Year   : 2012
Programme: BE   Full Marks: 100
Course: Object Oriented Programming In C ++   Pass Marks: 45
   Time   : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What do you mean by OO programming paradigm? Explain object oriented programming features with reference to real world objects.   8

   b) What is a dynamic constructor? Explain the constructor overloading with suitable example.   7

2. a) What is information hiding? What are access modes available in C++ to implement different levels of visibility? Explain with an example.   8   7

   b) Explain advantages and disadvantages of a Friend function with a suitable example.

3. a) How concept of DMA can be use in C++? Explain with appropriate example.   8

   b) What is multiple inheritance? Does ambiguity occurs in this type of inheritance? If yes, explain with an example.   7

4. a) The following figure shows minimum information required for each class. Write a program with member functions to read and display information of individual object. Every class should contain at least one constructor and should be inherited to other classes as well.   7

7
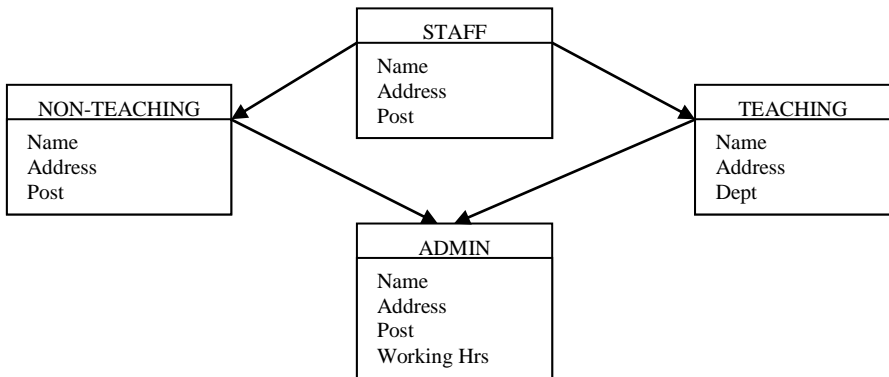
b) Explain and contrast the following:
 i. IS-A-rule
 ii. HAS-A-rule

5. a) Write a program to add two Times expressed in hours, minutes and seconds using operator overloading.   8

 b) What do you mean by pure polymorphism? Differentiate between function overloading and function overriding.   7

6. a) Do you find any advantages of Generic programming? Write a function template to calculate the average and multiplication of a numbers.   8

 b) Differentiate between Programming in Large and Programming in Small.   7

7. Write short notes on: (Any two)   2×5
 a) Message passing formalism.
 b) The non-linear behavior of complexity.
 c) Reusability implies non-inteference.