

# POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester: Fall

Year : 2010

Full Marks: 100

Pass Marks: 45

Time : 3 hrs.

*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 makes OOP a new paradigm? Explain your with suitable points. 7  
b) Differentiate between:  
 i. Programming in small and programming in large 8  
 ii. Interface and implementation
2. a) Explain various access specifiers Used in C++ with an example. 7  
b) Differentiate between constructor and destructor. Can there be more than one destructor in a program for destroying the same object. Illustrate your answer. 8
3. a) Explain the principal of substitutability. How does inheritance provide the concept of reusability? How do you define reusability of components? 7  
b) Differentiate between static and dynamic memory allocation. Write a simple program explaining the use of dynamic memory allocation which should include calculation of marks of 5 subjects of students and displaying the result as pass or fail. Pass mark is 45 out of 100 in each subject. 8
4. a) Differentiate between Class and Structure. Explain them with example. 7  
b) Create a class called Student with three data members (stdnt\_name [20], faculty [20], roll\_no), a function called readdata () to take the details of the students from the user, and a function called displaydata () to display the details of the students. In main, create two objects of the class Student and for each object call both of the functions. 8
5. a) What is a hybrid inheritance? Explain any three pros and three cons of inheritance? 8  
b) Develop a complete program for an institution which wishes to maintain a database of its staff. Declare a base class STAFF which include staff\_id and name. Now develop records for the following staffs with the given

information below:

- i. Lecturer (subject, department)
- ii. Administrative staff (post, department)

Each staff members should inherit staff\_id and name from base class.

6. a) What is polymorphism? Explain run-time polymorphism and compile time polymorphism with example each. 10  
b) Explain about deferred methods. 5
7. Write short notes on (Any Two) 2x5
  - a) CRC cards
  - b) Containership
  - c) Templates

POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester - Fall

Year : 2011

Full Marks: 100

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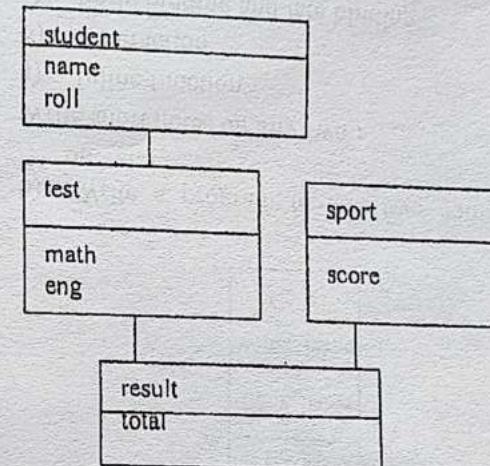
Time : 3 hrs.

*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 functionis 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**: 2x5
  - a) Comparing programming in small and programming in large
  - b) Message passing versus procedure call
  - c) Exception handling

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester – Spring

Year : 2011

Full Marks: 100

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) Explain and contrast the following:
    - i. RDD (Responsibility Driven Design)
    - ii. programming in small and programming in large7
  - b) What is the role of Object oriented design in OOP? Create a CRC card for fee payment system.8
  2. a) What influence object-oriented approach has on the software system design? Explain.7
  - b) Write a program to define a class to represent bowlers in a cricket team, having members: firstname, lastname, oversbowled, no. of Maiden overs, Rungiven, wicket taken with member functions to: (i) assign initial values (ii) display bowler's information.8
- OR**
- Create a class distance that has separate integer data member (fee and inches). Provide two member functions. First to initialize these data members and another function to add two distance objects passed as argument to this function and return new distance objects.8
- In main create three objects of class distance. Pass distance value to first of two objects and display the result from the third object.
3. a) How OOP (Object Oriented Programming) supports information hiding? What are the access modes that are available in C++? Explain with example.9
  - b) What is de- constructor? Can you have two destructors in a program? Give example to support your reason.6
  4. a) How does inheritance reuse the existing code? Explain them with example.8
  - b) What is protected derivation? How many ways we can access the private and protected members of a class. Explain.7
  5. a) State and explain about polymorphic variable and generic 7

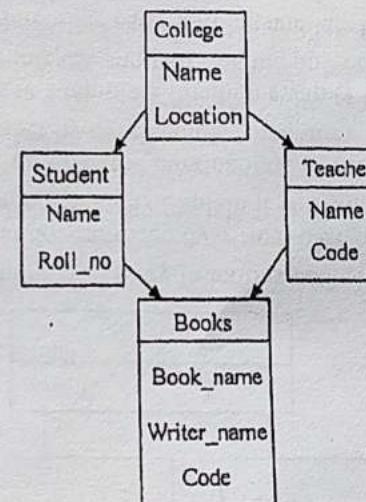
programming with suitable example.

- b) How can you achieve the runtime polymorphism in C++? Explain. 8  
What is Pure virtual function?

**OR**

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

6. a) The following figure shows minimum information required for each class. Write a program to realize the above program with necessary member functions to create the database and retrieve individual information. Every class should contain at least one constructor and should be inherited to other classes as well.8



7

- b) Write a program to add two complex numbers overloading "+" operator.2×5
7. Write short notes on any two :
- a) Inline function
  - b) Abstraction
  - c) Early binding and late binding

Level: Bachelor  
Programme: BE

POKHARAUNIVERSITY

Semester - Fall

Course: Object Oriented Programming in C++

Year : 2012  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

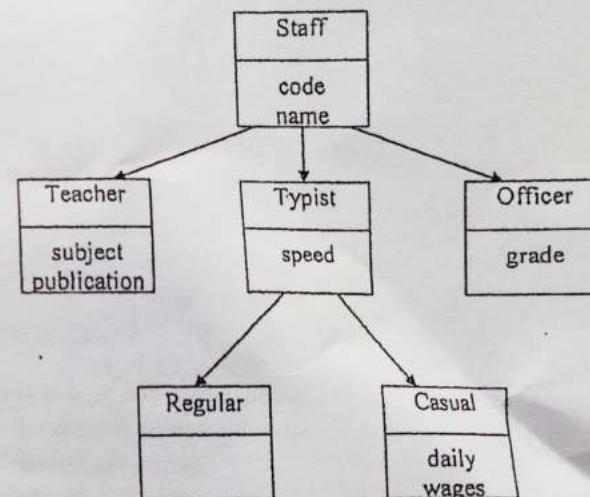
Candidates are required to give their answers in their own words as far as practicable.

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 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 and 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: 2x5
  - a) CRC cards
  - b) Inline function
  - c) The is - a relationship

POKHARA UNIVERSITY

Level: Bachelor

Semester: Spring

Year : 2012

Programme: BE

Full Marks: 100

Course: Object Oriented Programming In C++

Pass Marks: 45

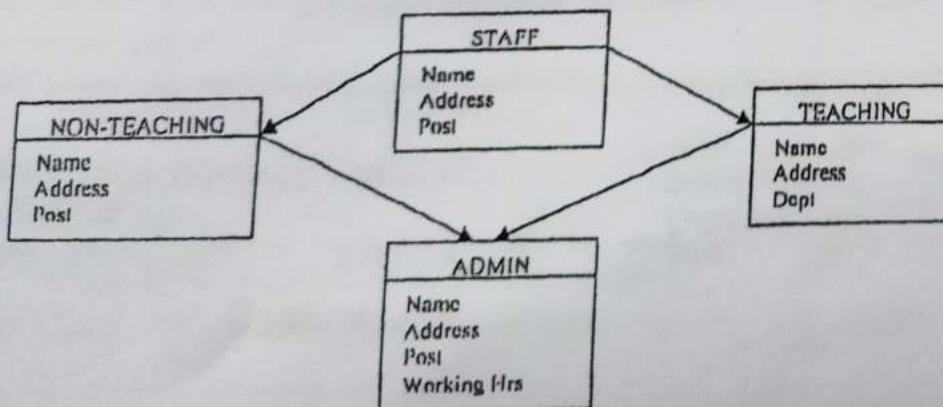
Time : 3 hrs.

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



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-interference.

# POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester: Spring

Year : 2013

Full Marks: 100

Pass Marks: 45

Time : 3 hrs.

*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.*

- a) What is the significance of forming abstractions while designing an Object Oriented System? In case of Object Oriented Programming, explain how do we have the view that computation is simulation? 8
- b) When and how do we make use of static data members of a class? Differentiate between virtual functions, friend functions and static member functions. 7
- a) What are access specifiers? Describe different access specifiers used C++. 7
- b) Discuss the various situations when a copy constructor is automatically invoked. How a default constructor can be equivalent to a constructor having default arguments. 8
- a) Write a class Time with three integer attributes hour, minute and second. Include following responsibilities in the class.
  - i. Default and parameterized constructor.
  - ii. Display method to display Time in hour: minute, second format.
  - iii. Appropriate operator overload to realize addition of two Time objects with '+' operator.
- b) Explain the principle of substitutability. How does inheritance provide the concept of reusability? 7
- a) How does inheritance influence the working of constructors and destructors? Class 'Y' has been derived from class 'X'. The class 'Y' does not contain any data members of its own. Does the class 'Y' require constructors? If yes why? 8
- b) How can Polymorphism be achieved during compile time and during 7

- run time? Explain with examples in C++.
- 5. a) What is exception? Define the types of exceptions. Explain in brief about the exception handling mechanism in C++. 8
- b) How are Object Oriented Programmes designed and developed according to the concept of RDD? Describe the entire process in brief. 7
- 6. a) Create a base class student. Use the class to store the name, dob, roll no and includes member function getdata (), discount (). Derive two classes PG and UG from student. Make dispresult () as virtual function and redefine this function in the derived class to suit the requirement. 8
- b) Specify is a rule and has a rule with suitable example. How are agreements sent to the base constructors in multiple inheritance? Whose responsibility is it? 8
- 7. Write short notes on: (Any two) 2x
  - a) Programming in small and in large
  - b) Generalization
  - c) Inline function.

**POKHARA UNIVERSITY**

Level: Bachelor      Semester: Fall  
 Programme: BE  
 Course: Object Oriented Programming in C++

Year : 2013  
 Full Marks: 100  
 Pass Marks: 45  
 Time : 3 hrs.

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

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*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:

- 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.

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.

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

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

- 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.

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

overloading.

- b) What is the difference between static binding and runtime binding?

Explain with a suitable code.

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.

- 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.

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

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

7. Write short notes on: (Any two)

a) Dynamic Constructor.

b) Virtual Destructor.

c) CRC Cards.

7

8

7

8

2x5

8

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8

# POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester: Spring

Year : 2014

Full Marks: 100

Pass Marks: 45

Time : 3 hrs.

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

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*Attempt all the questions.*

1. a) With the help of object oriented programming, explain how can object oriented programming cope in solving the complex program. Explain computation as simulation. 7
- b) Where do you use friend function? Write a program to find largest of four integer numbers. Your program should have three classes and each classes should have one integer number. 8
2. a) Differentiate message passing and procedure call with suitable example. What are possible memory errors in programming? 7
- b) Explain how does composition provide re-usability? Differentiate between Is-A rule and Has-A rule. 8
3. a) Can you derive a Pointer from Base class? Explain with suitable example. 7
- b) What are the advantages of using runtime polymorphism over compile time polymorphism. How does overloading differ from overriding? Explain. 8
4. a) What is virtual function? When do we make a function virtual? Explain with suitable example. 7
- b) What is a template? Explain different type of templates used in C++. 7
5. a) What is a software component? Explain the different steps for developing and implementing software components in Object Oriented Programming. 7
- b) What is de-constructor? Can you have two destructors in a class? Give example to support your reason. 8
6. a) What is information hiding? What are access modes available in C++ 7

to implement different levels of visibility? Explain with example.

- b) Create a class Person with data members Name, Age and Address. Create another class Teacher with data members Qualification and Department. Also create another class Student with data member Program and Semester. Both classes are inherited from the class Person. Every class has at least one constructor which uses base class constructor. Create member function ShowData() in each to display the information of the class member.

7. Write short notes on: (Any two) 2x5

- a) Programming in Small and Programming in Large.
- b) Exception Handling.
- c) Copy constructor.

POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester: Fall

Year : 2014

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

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

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Attempt all the questions.

1. a) What makes the OOP better than POP. Explain with features of OOP. 8  
 b) What sorts of shortcomings of structure are addressed by classes? Explain giving appropriate examples. 7

2. a) What are static data members and static member functions? Show their significance giving examples. 8  
 b) What is message passing? Describe with example. 7

3. a) Define Subtype and subclass. Explain why multiple inheritance is dangerous. 8

- b) How composition differs from inheritance? Write a program to concatenate two strings (name and address of a person) using the concept of containership. 7

4. a) Write a program with class Fibo to realize following code snippet. 7

```
Fibo f = 1;
For (i=1;i<=10;i++){
    ++f;
    f.display();
}
```

(Hint: overload ++ operator and conversion technique)

- b) Define two class named 'Polar' and 'Rectangle' to represent points in polar and rectangle systems. Use conversion routine to convert from one system to another system. 8

5. a) What is generic and templates. Create a template to find the sum of two integers and floats. 8

- b) What do you mean by RDD? What is the use of CRC card? 7

6. a) Explain the terms: 8

- i. Responsibility implies non interference  
 ii. Programming in Large and Programming in Small  
 b) Discuss the context where it becomes important to make base class virtual. Also include an appropriate example. 7  
 2x5  
 1. Write short notes on: (Any two)  
 a) Non-linear behavior of complexity  
 b) Deferred method  
 c) Exception Handling.

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Object Oriented Programming in C++

Semester: Spring

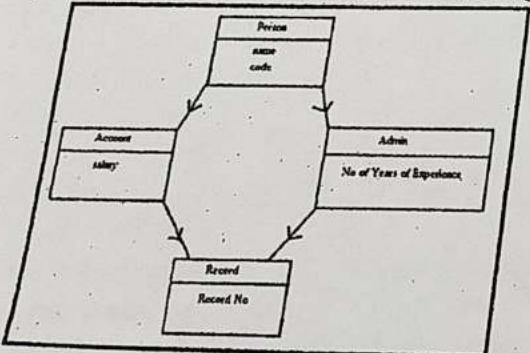
Year : 2015  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

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) Describe Object Oriented Programming as a new paradigm in computer programming field. Explain computation as simulation. 7
- b) "Friend function breaches the encapsulation", justify. Also mention the uses of friend function. 8
2. a) What are the common types of functions available in C++? Define the 3 common types of functions in C++ with a program. 8
- b) Can we have more than one destructor in a class? Write a program to add two complex numbers using the concept of constructor 7
3. a) Explain and contrast the following: 8
  - i. Interface and implementation
  - ii. Programming in small and programming in large
- b) "Ambiguity is essential evil", explain by example how it can effectively solve in complex programming. 7
4. a) Consider the class network of the following figure. 8



The class *Record* derives information from both *Account* and *Admin*

- classes and in turn derive information from the class *Person*. Define all the four classes with at least one parameterized constructor and 'void display()' method in each class. In main () function, create the object of the class '*Record*' and initialize all the data members and display them.
- b) Define the role of this pointer and pure abstract class in object oriented programming to create multiple object with suitable program. 8
  5. a) How does a polymorphism play constructive role in application development? Which type of polymorphism is essential for the computation of distance among two cities from the specific location. The unit of measurements are feet and inch. (Also use standard unit if essential). 8
  - b) What do you mean by generic programming? Illustrate it with an example of function template. 7
  6. a) "A constructor is a special member function that automatically initializes the objects of its class", support this statement with a program of all types of constructors. Also enlist the characters of constructors. 7
  - b) How can you define pure virtual functions in C++? The pure virtual functions do nothing but it is defined in base class, why? 8
  7. Write short notes on: (Any two) 2x5
    - a) Non-linear behavior of complexity
    - b) Is-a rule and has-a rule
    - c) Memory recovery

POKHARA UNIVERSITY

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

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

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*Attempt all the questions.*

- |   |   |   |    |
|---|---|---|----|
| a) How does making use of abstractions help in designing of an Object Oriented System? Explain with an example.   | 7 | 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.   | 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 | b) How can you achieve run time polymorphism in C++? Discuss with a suitable example.   | 7  |
| a) What is an inline function? Explain its importance with the help of an example program.  | 7 | 6. a) Define a class called stack and implement generic methods to push and pop the elements from the stack.  | 8  |
| 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 | b) Path-follower Robot:<br>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  |
| 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 | 7. Write short notes on: (Any two)<br>a) Responsibility Driven Design.<br>b) Stack versus Heap Based Allocation.<br>c) Virtual functions.   | 2x |
| b) Explain how Inheritance supports Reusability? Describe the syntax of multiple and multilevel inheritance?  | 7 |   |    |
| 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 |   |    |
| a) What is the benefit of overloading an operator? Design a Soccer Player class that includes three integer fields: a player's jersey number, number of goals, number of assists and necessary  | 8 |   |    |

POKHARA UNIVERSITY

Level: Bachelor Semester: Fall Year : 2016  
Programme: BE Full Marks: 100  
Course: Object Oriented Programming in C++ Pass Marks: 45  
Time : 3 hrs

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 Object-oriented programming is a superior than Procedural-oriented Programming. Explain.   | 8 |
|    | b) | Differentiate between structure and class. Why is class preferred over structure? Support your answer 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 example.  | 8 |
|    | b) | What do you mean by dynamic constructor? Explain its application by a program to compute the complex numbers.  | 7 |
| 3. | a) | Create classes called class1 and class2 with each 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) | Under what condition virtual base class is created? Explain it with suitable examples.   | 7 |
| 4. | a) | State principle of substitutability. Explain sub-classing for specialization, generalization. List out the disadvantages of inheritance.   | 8 |
|    | b) | Define type conversion. Explain with example conversion from one class type to another class type.   | 7 |
| 5. | a) | When do you use virtual function? How it provides run time polymorphism. Explain it with suitable example.   | 8 |
|    | b) | What are the advantages of Generic programming ? Write a function template to calculate the average and multiplication of numbers.   | 7 |

6. a) What is software component? Explain about implementation and integration of component with real world example. 8  
 b) Do you find any advantages of adopting Responsibility Driven Design? Explain with the help of suitable example. 7

7. Write short notes on: (Any two) 2×5

  - a) The is-a and has-a rule
  - b) Operator overloading
  - c) CRC card

POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester: Spring

Year : 2016

Full Marks: 100

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 different aspects of software components? 7  
b) Explain Message Passing Formalism with syntax in C++. What is stack versus heap memory allocation? 8
2. a) Is it mandatory to create constructor in derived class if base class contains constructor? "Constructor is called in derived class but it can't be inherited". Support your answer with suitable example. 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 greatest height. 8
3. a) Differentiate between various access specifiers used in a class. Explain it with reference of an example. 7  
b) What is inheritance? What are the different forms of inheritance? 8
4. a) Describe overriding. How do you differentiate function overloading from method overriding. Explain with suitable example. 7  
b) Differentiate between
  - i. Subclass and Subtype
  - ii. The is-a rule and has-a rule
8
5. a) Define operator overloading. Write a simple program to overload unary ++ operator. 7  
b) What are advantages of dynamic memory allocation? Explain with suitable example. 8  
a) What is exception? Write the syntax for exception handling in C++. 7

7. Write short notes on: (Any two)
- a) Virtual Function Vs. Pure Virtual Function
  - b) STL
  - c) RDD
- b) Write a program that catches multiple exceptions.  
two integers and floats. 2×5

साम सेवनी सम्बर्स पट्ट प्लेक्यु सर्विस  
बालकुमारी, नलितपुर ९८४९५९९५९२  
NCIT College

**POKHARA UNIVERSITY**

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester: Fall

Year : 2017

Full Marks: 100

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) Describe how object oriented programming models the real world problem with reference of agents, method, behavior and responsibilities? 7
- b) What do you mean by static data member of a class? Explain the characteristics of a static data member. 8
2. a) Does a friend function violate the data hiding? Explain briefly. Write a program to swap variables of two classes using friend function. 8
- b) What is constructor? Can constructor be overloaded? If yes, explain how that is possible with reference of an example. 7
3. a) Differentiate methods of arguments passing in constructor and destructor. 7
- b) Inheritance supports the reusability characteristics of OOP. Justify your answer. Explain ambiguity that occurs in multiple inheritances. 8
4. a) Write base class that ask the user to enter Time (hour minute and second) and derived class adds the Time of its own with the base. Finally make third class that is friend of derived and calculate the difference of base class time and its own time. 7
- b) When base class and derived class have same function name what happens when derived class object calls the function? Differentiate overloading with overriding. 8
5. a) What is polymorphism? How operator overloading is used to support polymorphism? Explain it by overloading '+' operator to concatenate two strings. 7
- b) What is the advantage of using template functions? Write a program to illustrate a template function with two arguments. 8

6. a) Reusability implies non-interference. Explain with example. 7
- b) Explain in brief about interface and implementation. How different components of Software design can be represented and integrated? Discuss in brief. 8
7. Write short notes on: (Any two) 2x5
  - a) CRC card.
  - b) Virtual function
  - c) Features of object-oriented programming

POKHARA UNIVERSITY

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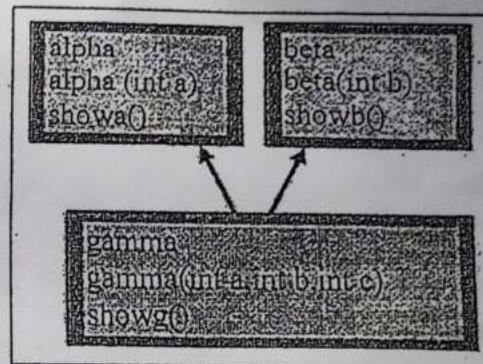
Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What are shortcomings of procedural oriented programming? Explain the notion of "everything is an object" in object oriented programming. 7
- b) Differentiate between the concept of computation as simulation and responsibility implies non-interference. 8
2. a) What is responsibility driven design? Draw a CRC Card of student. 7
- b) What is encapsulation? How can encapsulation be enforced in C++? Explain with suitable code. 8
3. a) What is constructor? Write an example of copy constructor and explain each line of code. 8
- b) Create a class time a constructor having hour, minute and second as arguments is use to take two time data from user. The add function that takes two class objects as arguments adds them respectively then display aggregate result? (Apply 60 second=1 minutes and 60 minutes= 1 hour). 7
4. a) Why is destructor function required in class? Can a destructor accept arguments? 7
- b) What is inheritance? Explain different forms of inheritance. 8
5. a) How does visibility mode control the access of members in the derived class? Explain with an example. 7

- b) Write a complete program with reference to the given figure.



6. a) What are generic and templates? Create a template to find the sum of two integers and floats. 8
- b) Write a complete program to convert the polar co-ordinates into rectangular coordinates.  
(hint: polar co-ordinates (radius, angle) and rectangular co-ordinates (x,y) where  $x=r\cos(\text{angle})$  and  $y=r\sin(\text{angle})$ ). 7
7. Write short notes on: (Any two) 2×5
  - a) Friend function
  - b) Pure polymorphism
  - c) Expectation mechanism

POKHARA UNIVERSITY

Level: Bachelor Semester: Fall Year : 2018  
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) | With the help of object oriented programming explain how can object oriented programming cope in solving the complex program. Explain computation as simulation.  | 7 |
|    | b) | Private data and function of a class cannot be accessed from outside function. Explain how it is possible to access then with reference of an example.  | 8 |
| 2. | a) | What is constructor? Can constructor be overloaded? If yes how?   | 7 |
|    | b) | Create a class called Employee with data member Code, Name, Address, Salary. Create a constructor to initialize the member of the class. Also create another constructor so that we can create an object from another object. Define member function display() to display the information of the class. | 8 |
| 3. | a) | Explain how does composition provide re-usability? Differentiate between Is-A rule and Has-A rule.  | 7 |
|    | b) | What is a hybrid inheritance? Does ambiguity occur in hybrid inheritance? If Yes? How can you remove this? Explain with example.  | 8 |
| 4. | a) | What are the advantages and disadvantages of using friend function?. Explain with example program.  | 7 |
|    | b) | What is type casting? Write a program to read a height of a person in Feet and Inches and convert it into Meter using user defined to class type conversion method. 1 meter=3.28084 feet, 1 feet=12 inch.   | 8 |
| 5. | a) | What is function template? Create a template function to swap two values.   | 7 |
|    | b) | Create a class Person with data members Name, Age and Address. Create another class Teacher with data members Qualification and Department. Also create another class Student with data member Program and Semester. Both class are inherited from the class Person.                                    | 8 |

Every class has at least one constructor which uses base class constructor. Create member function Show Data() in each to display the information of the class member.

6. a) What is compile time and run time polymorphism? How can you achieve runtime polymorphism in C++? Explain deferred method. 7  
 b) What are the use of new and delete operator in a program ? Explain with an suitable example. 8

7. Write short notes on: (Any two) 2x5

  - a) Overriding
  - b) Exception Handling
  - c) Standard Template Library

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE

Semester: Spring

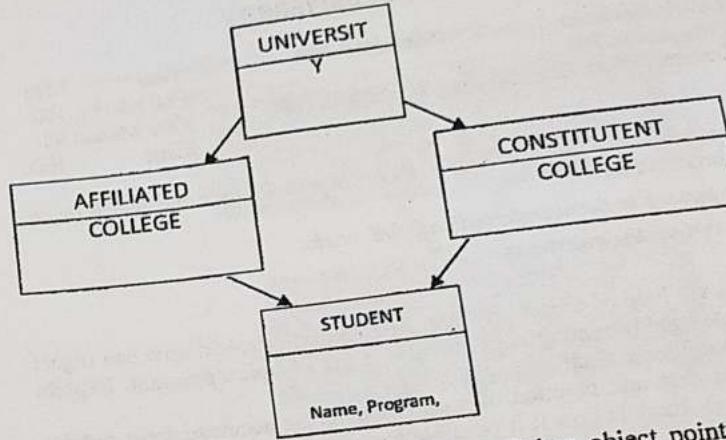
Year : 2018  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

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 computation as simulation. Why the behaviour of complexity is regarded as non-linear? 7
- b) What are the advantages of oriented programming over structural programming? Explain with suitable examples. 8
2. a) Illustrate the role of friend function in object oriented programming with its pros and cons. Also write a suitable program. 8
- b) Can a class have more than one constructor? If yes, justify your answer with help of a program that reads firstName and secondName then concatenates into Name. (use suitable type of constructor). 7
3. a) Can you have more than one constructor in a program? Write a program to find area of a triangle (when its sides are given) using the concept of overloaded constructor. 8
- b) Define Reusability? What are the advantages of software Reusability in OOP design? 7
4. a) What are the different types of inheritance? Describe multiple inheritance with an example. 8
- b) The following figure shows minimum information required for each class. Write a program by realize the necessary 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



5. a) Why does 'this' pointer is widely used than object pointer? Write a programme to implement pure polymorphism. 7
- b) Write a program showing '+' and '-' operator overloading. 8
6. a) Differentiate between template function and template class. How can we compute the roots of quadratic equation by using function template? Explain by examples. 8

OR

What is application of exception handling? Illustrate the process of exception handling with necessary programming modules. 7

- b) Differentiate between:
  - i. Programming in Large and Programming in Small
  - ii. CRC Card and sequence diagram

7. Write short notes on (Any Two):
  - a) Message passing formalism
  - b) Software Components
  - c) Abstraction mechanism

7

2×5

POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Object Oriented Programming in C++

Semester: Fall

Year : 2019

Full Marks: 100

Pass Marks: 45

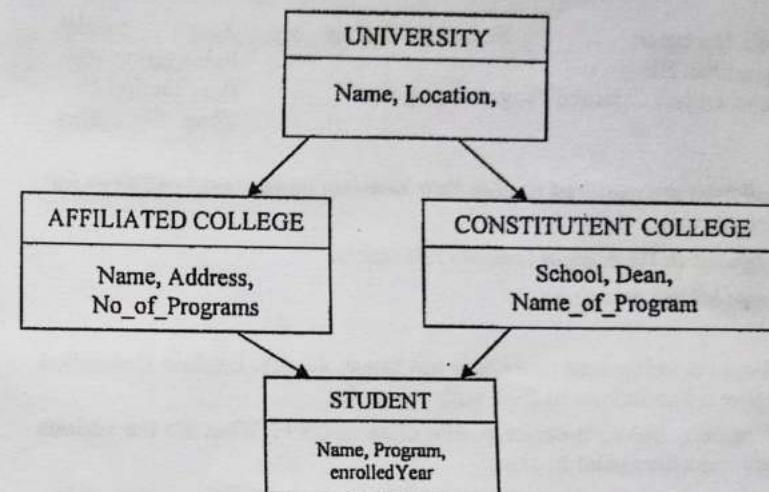
Time : 3hrs.

*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 the use of abstraction mechanism in C++? Explain with example. 7
- b) What are the different types of access specifiers? Using a class write a program that receives inputs principle amount, time and rate. Keeping rate 8% as the default argument, calculate the simple interest for three customers. 8
2. a) What is data hiding? How do you achieve data hiding in C++? Explain with a suitable program. 7
- b) What are the advantage of inheritance? Explain multi-level inheritance with example. 8
3. a) How can you overload constructors? Explain with suitable example. 8
- b) What is dynamic memory allocation? How do you allocate memory dynamically in C++? Explain with an example. 7
4. a) The following figure shows minimum information required for each class. Write a program by realizing the necessary 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. 8



- b) What do you mean by virtual base class? At which condition it has to be implemented? Explain with suitable example. 7
5. a) What is operator overloading? Write a program to find the sum and difference of any two complex numbers by overloading '+' and '-' operator. 8
- b) Why is 'this' pointer widely used than object pointer? Write a programme to implement pure polymorphism. 7
6. a) What is exception? Explain in brief about the exception handling mechanism in C++. 7
- b) Explain CRC card and sequence diagram with suitable example. 8
7. Write short notes on: (Any two) 2×5
  - a) Software reusability
  - b) Template functions
  - c) Software component

POKHARA UNIVERSITY

Level: Bachelor Semester: Spring  
 Programme: BE  
 Course: Object Oriented Programming C++

Year : 2019  
 Full Marks: 100  
 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) Software development process is not linear. Justify. Explain abstraction mechanism technique in C++ with examples. 7
- b) Differentiate between structure and class in C++? What are the various access specifiers used in class? 8
2. a) Illustrate the role of friend function in object oriented programming with its pros and cons. Also write a suitable program. 8
- b) What is dynamic memory allocation? How is memory allocated and de-allocated in C++? Explain with examples 7
3. a) Explain subtype, principle of substitutability, object pointer, this pointer, virtual function with examples. 7
- b) Write a program to input two vector coordinates from a base class named "Base". Class "Derived" inherits all the properties of class Base. Class "Derived" must contain a function named add\_vector() that adds the two vectors input from the base class and finally display the result from a function display() that is friend with the base class. 8
4. a) Create a class called Person with suitable data members to represent their name and age. Use member functions to initialize and display these information. Derive Student and Employee from the Person class with their unique features. Initialize objects of these classes using constructor and display the information. 7
- b) How can you achieve compile time and runtime polymorphism. Explain with examples. 8
5. a) What do you mean by type casting? Write a program to convert an object of Polar class into the object of Rectangle class by using type conversion routine. 8

- b) Write a program to add two complex numbers. Your program should have three objects. Each object contains two attributes (i.e real and imaginary part). Now add each attribute and save them into third object separately. Use the concept of '+' operator overloading. 7
6. a) Explain the purpose of template programming with examples. Describe the technique of exception handling in C++ with examples. 8
- b) Explain CRC cards and sequence diagram with examples. 7
7. Write short notes on: (Any two) 2>
  - a) Message Passing in C++
  - b) Inline function
  - c) Abstraction mechanism

Level: Bachelor      Semester: Fall  
 Programme: BE  
 Course: Object Oriented Programming in C++

Year : 2020  
 Full Marks: 100  
 Pass Marks: 45  
 Time : 3hrs.

7. Write short notes on: (Any two)
- Dynamic memory allocation
  - This pointer
  - Template class.

*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.*

- a) What are the key features of Object Oriented Programming? Explain with example. 7
- b) Friend function is not the member function of a class. Justify the statement with suitable program. 8
- a) Why do you use inline function? Explain with a suitable example. 7
- b) What are default and parameterized constructors? Write a program to illustrated parameterized constructor. 8
- a) What is copy constructor in C++? Is it possible to pass object as argument in copy constructor? Explain with suitable program. 7
- b) How inheritance does supports reusability? What are the different forms of inheritance? Explain with example. 8
- a) Why is protected access specifier used in C++? Explain with example different types of inheritance with examples. 7
- b) Write a program to overload multiplication operator (\*) showing the multiplication of two objects. 8
- a) What is virtual function? When do we make a function virtual? Explain with appropriate example. 8
- b) Create a template function swap() and use it to swap two integers,two floating point data and two characters. 7
- a) Differentiate between i) interface and implementation and ii) coupling and cohesion. 7
- b) What is CRC card? Why is it necessary in programming? Prepare a CRC card for library management system 8

**POKHARA UNIVERSITY**

Level: Bachelor

Semester – Spring

Year: 2020

Program: BE

Full Marks: 70

Course: Object Oriented Programming in C++

Pass Marks: 31.5

Time: 2 hrs.

*Candidates are required to answer in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

**Group - A: (5×10=50)**

- Q. N. 1 In your opinion, how does the Object Oriented thinking solve the software crisis? List the basic characters of object oriented programming and explain any two characteristics that are directly applicable for the software maintenance. 2+5+3
- Q. N. 2 When should you prefer the use of inline function over not inline function? Explain friend function and the situation in which you should use this concept? Explain with example program. 3+5+2

**OR**

4+6

Differentiate between static data member with not static data member with example. Explain the types of constructor with example.

- Q. N. 3 (3) “Constructor cannot be inherited though derived class can call the base class constructor.” Justify the above example with example. 10
- Q. N. 4 Both child class and its parent class have same function signature. Which version of function will be called by the object pointer of parent class that is pointing to the child class's object? Explain the reason. When do we need to use virtual function? Explain with example program. 10
- Q. N. 5 Suppose you are a programmer, you are assigned a task to develop a software with all the requirements but the requirements doesn't include the data types of data structures to be used in classes and functions. As a programmer, you are not sure about the data types, how do you solve this issue and create a generalized classes and functions. Write an example program to support your answer. 10

**Group - B: (1×20=20)**

- Q. N. 6 a) You are given a task to develop a system for a bank that keeps records of costumers and its employees. 5×3
- I. Identify possible components
- II. Draw CRC card for all the components you listed
- III. Draw sequence diagram of process—“withdraw money from ATM”.
- b) “A task that would take one programmer two months to perform could not be completed by two programmers working for one month”. Justify this statement. 5

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Object Oriented Programming in C++

Semester: Fall

Year : 2021  
Full Marks: 100  
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 features of Object Oriented Programming have made it more special than Procedural Oriented Programming? Explain. 7
- b) Explain the advantages of making any argument as default argument in function definition. 8
2. a) Does friend function breach encapsulation? Justify with examples. 7
- b) Explain CRC cards and sequence diagram with examples 8
3. a) Can you make same name to define more than one constructors? Explain with example. 8
- b) Why do you need a destructor in a program? Can you pass arguments in a destructor? Explain with an example program. 7
4. a) How can you solve the ambiguity that arises in multiple inheritance? Explain with program example. 7
- b) List out the types of inheritance that are supported in C++. Explain any three of them with program code. 8
5. a) Explain subtype, principle of substitutability, object pointer, this pointer, virtual function with examples. 8
- b) How can you achieve compile time and runtime polymorphism? Explain with example. 7
6. a) Why operators are overloaded? We have a class name Complex which have a data member real and imaginary. Default and parameterized constructor are there to initialize the data member. WAP overloading unary operator ‘++’ where real and imaginary data member will be incremented and ‘+’ operator to add two complex number. 8
- b) Explain the purpose of template programming with examples. Describe the technique of exception handling in C++ with examples. 7

7. Write short notes on: (Any two)

- a) Memory leak
- b) Software Components
- c) Computation as simulation

2×5

## POKHARA UNIVERSITY

Level: Bachelor

Semester: Spring

Year : 2021

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 is data abstraction achieved in Object Oriented Programming? Explain the features of Object Oriented Programming. 8
- b) What do you mean by static data member? Explain with examples. 7
2. a) Create classes called class1 and class2 with each of having one private member. Add member function to set a value (say set\_value) on each class. Add one more function max() that is friendly to both classes. The max() function should compare two private member of the two classes and show maximum among them. Create one object for each class then set a value to each object. Display the maximum number among them. 8
- b) What do you understand by memory allocation? Describe memory allocation and deallocation methods in C++. 7
3. a) Explain default and parameterized constructors with examples. 8
- b) How can you solve the problem due to the same function name that occurs in both base and derived classes? Explain with example. 7
4. a) How does inheritance support reusability? List out different forms of inheritance and explain any two of them. 8
- b) What do you mean by virtual base class? In which condition do you implement it? Explain with suitable example. 7
5. a) Explain operator overloading in brief. Write a program to overload unary minus (-) operator. 8
- b) Explain function overriding with a suitable program. 7
6. a) Do you find any advantages of generic programming? Write a function template to find the product of two numbers. 7
- b) What are exceptions? How are they handled in C++? 8

7. Write short notes on: (Any two)

- a) CRC cards /
- b) Sequence diagram
- c) Inline function