

# **BACHELOR OF COMPUTER APPLICATIONS**

**(BCA)**

BCA/ASSIGN/III/YEAR/14-15

**ASSIGNMENTS**

**(For July, 2014 and Jan., 2015 sessions)**

**(3<sup>rd</sup> Semester (Revised Syllabus))**

**(MCS-014, MCS-021, MCS-023, BCS-031, BCSL-032, BCSL-033, BCSL-034)**



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES  
INDIRA GANDHI NATIONAL OPEN UNIVERSITY  
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**Course Code** : **MCS-014**  
**Course Title** : **Systems Analysis and Design**  
**Assignment Number** : **BCA(III)/014/Assign/14-15**  
**Assignment Marks** : **100**  
**Weightage** : **25%**  
**Last Dates for Submission** : **15<sup>th</sup> October, 2014 (For July 2014 Session)**  
**15<sup>th</sup> April, 2015 (For January 2015 Session)**

**This assignment has three questions. Answer all questions. Questions carry a total of 80 marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.**

Q1: Develop SRS for **Online Examination Form Submission System**. SRS should be as per IEEE standard SRS template. Make necessary assumptions.

(30 marks)

Q2: Draw the DFDs upto 3<sup>rd</sup> level for **Online Examination Form Submission System**.

(30 marks)

Q3: Draw ERD for **Online Examination Form Submission System**.  
Make necessary assumptions.

(20 marks)

**Course Code** : **MCS-021**  
**Course Title** : **Data and File Structures**  
**Assignment Number** : **BCA(III)/021/Assign/14-15**  
**Maximum Marks** : **100**  
**Weightage** : **25%**  
**Last Dates for Submission** : **15<sup>th</sup> October, 2014 (For July 2014 Session)**  
**15<sup>th</sup> April, 2015 (For January 2015 Session)**

**This assignment has four questions which carry 80 marks. Answer all the questions. Each question carries 20 marks. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide. All the implementations should be in C language.**

**Question 1:**

Write an algorithm for the implementation of Circular Doubly Linked Lists.

**Question 2:**

Implement multiple stacks in a single dimensional array. Write algorithms for various stack operations for them.

**Question 3:**

Write a note of not more than 5 pages summarizing the latest research in the area of “Sorting Algorithms”. Refer to various journals and other online resources. Indicate them in your assignment.

**Question 4:**

Explain reverse-delete algorithm. What are its applications?

**Course Code** : **MCS-023**  
**Course Title** : **Introduction to Database Management Systems**  
**Assignment Number** : **BCA(III)/023/Assign /14-15**  
**Maximum Marks** : **100**  
**Weightage** : **25%**  
**Last Dates for Submission** : **15<sup>th</sup> October, 2014 (For July 2014 Session)**  
**15<sup>th</sup> April, 2015 (For January 2015 Session)**

**This assignment has SIX questions. Answer all questions of total 80 marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance your explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Answer to each part of the question should be confined to about 300 words.**

**Question 1:** (15 Marks)

Construct an ER diagram for a Banking System. Clearly indicate the entities, relationships, cardinality and the key constraints. Also, derive the un-normalized relational database tables with the help of this diagram.

**Question 2:** (20 Marks)

Explain decomposition of a database in database design. Why consolidation of a database after normalization is considered while designing a database. Explain with the help of a suitable example.

**Question 3:** (5X2=10 Marks)

- (a) What is non-loss decomposition in database? How it is useful in database?
- (b) Explain evaluation of expression process in query optimization.

**Question 4:** (1X15=15 Marks)

We have following relations:  
Supplier(S#,sname,status,city)  
Parts(P#,pname,color,weight,city)  
SP(S#,P#,quantity)

Answer the following queries in SQL.

- (i) Find name of supplier for city = 'Delhi'.
- (ii) Find suppliers whose name start with 'AB'
- (iii) Find all suppliers whose status is 10, 20 or 30.
- (iv) Find total number of city of all suppliers.
- (v) Find s# of supplier who supplies 'red' part.
- (vi) Count number of supplier who supplies 'red' part.
- (vii) Sort the supplier table by sname.

- (viii) Find name of parts whose color is 'red'
- (ix) Find parts name whose weight less than 10 kg.
- (x) Find all parts whose weight from 10 to 20 kg.
- (xi) Find average weight of all parts.
- (xii) Find S# of supplier who supply part 'p2'
- (xiii) Find name of supplier who supply maximum parts.
- (xiv) Sort the parts table by pname.
- (xv) Find the parts which weigh 10kg or above and are in 'red' colour

**Question 4:**

**(10 Marks)**

- (a) Explain ACID properties of Transaction with suitable example.
- (b) Explain TWO phase locking.

**Question 5:**

**(5X2=10 Marks)**

- (a) Consider table R(A,B,C,D,E) with FDs as  $A \rightarrow B$ ,  $BC \rightarrow E$  and  $ED \rightarrow A$ . The table is in which normal form? Justify your answer.
- (b) Explain system recovery procedure with check point record.

<b>Course Code</b>	<b>:</b>	<b>BCS-031</b>
<b>Course Title</b>	<b>:</b>	<b>Programming in C++</b>
<b>Assignment Number</b>	<b>:</b>	<b>BCA(III)-031/Assign/14-15</b>
<b>Maximum Marks</b>	<b>:</b>	<b>100</b>
<b>Weightage</b>	<b>:</b>	<b>25%</b>
<b>Last Date of Submission</b>	<b>:</b>	<b>15<sup>th</sup> October, 2014 (For July 2014 Session)</b> <b>15<sup>th</sup> April, 2015 (For January 2015 Session)</b>

**This assignment has five questions carrying a total of 80 marks. Answer all the questions. Rest 20 marks are for viva-voce. You may use illustrations and diagrams to enhance explanations. Please go through the guidelines regarding assignments, given in the Programme Guide. Wherever required, you may write C++ program and take its printout along with its output as part of solution.**

**Question 1:**

- (a) What is Object Oriented Programming? Explain its features with example. **(5 Marks)**
- (b) Write a C++ program to create Matrix class. This class should have functions to find the sum and difference of two matrices. **(9 Marks)**
- (c) Explain the usage of the following C++ operators with the help of an example program. **(6 Marks)**
  - (a) Relational Operator
  - (b) Logical Operators
  - (c) Scope resolution operator

**Question 2:**

- (a) Define the class Teacher with all the basic attributes such as Name, Department, Subjects, date\_of\_joining, years\_of\_experience etc. Define constructor(s), member functions **display\_detail()** for displaying the Teacher details. Use appropriate access control specifiers in this program. Also inherit Post\_Graduate\_Teacher from Teacher class. **(9 Marks)**
- (b) Explain the following terms in the context of object oriented programming. Also explain how these concepts are implemented in C++ by giving an example program for each. **(6 Marks)**
  - (a) Virtual Function
  - (b) Operator Overloading

**Question 3:**

- (a) What is polymorphism? What are different forms of polymorphism? Explain implementation of polymorphism with the help of a C++ program. **(8 Marks)**

- (b) What is access control specifier ? Explain the need of different access control specifiers with example.

**(7 Marks)**

**Question 4 :**

- (a) Explain the concept of copy constructor with the help of an example program. **(4 Marks)**
- (b) What is an exception? How an exception is different from an error? Explain advantage of exceptions handling in C++, with the help of an example program. **(6 Marks)**
- (c) What is data stream? Explain stream hierarchy in C++. **(5 Marks)**

**Question 5:**

- (a) What is template? Explain advantage of using template in C++? Write C++ program to explain function template and class template. **(7 Marks)**
- (b) What is inheritance? Explain the different types of inheritance supported by C++? Explain whether constructors are inherited by derived class in C++ or not, write a program in support of your claim and show the output. **(8 Marks)**



**Course Code** : **BCSL-032**  
**Title** : **C++ Programming Lab**  
**Assignment Number** : **BCA (III)/BCSL-032/Assign/14-15**  
**Maximum Marks** : **50**  
**Weightage** : **25%**  
**Last date of Submission** : **15<sup>th</sup> October, 2014 (For July 2014 Session)**  
**15<sup>th</sup> April, 2015 (For January 2015 Session)**

**Note: This assignment has four questions. Answer all the questions. These questions carry 40 marks. Rest 10 marks are for viva voce. You may give proper comments in your programs to enhance the explanation. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.**

**Question 1:**

Write a C++ program to find the average of 10 given numbers. This program should also find largest and smallest numbers in these 10 numbers. **(5 Marks)**

**Question 2:**

Write a C++ program to create an Account class with proper constructor(s) and destructor to manage Bank Account. Inherit Saving\_Account and Current\_Account e classes from Account class and override method for deposit and withdrawal in Account class. Make necessary assumptions wherever required. **(15 Marks)**

**Question 3:**

Write a program in C++ to overload “-” operator in such a way that ,when it is applied between two string it return the difference of length of the two strings. **(10 Marks)**

**Question 4:**

Write a program in C++ to create a template for Queue data structure. **(10 Marks)**

**Course Code** : **BCSL-033**  
**Course Title** : **Data and File Structures Lab**  
**Assignment Number** : **BCA(III)-033/Assign/14-15**  
**Maximum Marks** : **50**  
**Weightage** : **25%**  
**Last Dates for Submission** : **15<sup>th</sup> October, 2014 (For July 2014 Session)**  
**15<sup>th</sup> April, 2015 (For January 2015 Session)**

**This assignment has two questions, each of 20 marks.10 marks are for viva-voce. Attach input and output of the program to the assignment. Write programs in ‘C’ language.**

**Question 1:** **(20 marks)**

Write algorithm and program that accepts two integers as input and prints their sum as output. Each integer will have at least 25 digits.

**Question 2:** **(20 marks)**

Write algorithm and program for generation of AVL tree for a given set of integers.

**Course Code** : **BCSL-034**  
**Title** : **DBMS Lab**  
**Assignment Number** : **BCA(III)-034/Assign/14-15**  
**Maximum Marks** : **50**  
**Weightage** : **25%**  
**Last date of Submission** : **15<sup>th</sup> October, 2014 (For July 2014 Session)**  
**15<sup>th</sup> April, 2015 (For January 2015 Session)**

**This assignment has only one question. Answer the question. This question carries 40 marks. Rest 10 marks are for viva voce. You may use illustrations and diagrams to enhance the explanation. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.**

**Q1:** A **Dental Clinic** requires a computerized system to automatize its front office operations that support the following functionalities:

- Query support
- Report generation
- Easy input facility for new data
- Update necessary details about the latest available facilities, Charges for various procedures/treatments, details of the timings, Doctors/Dentists, staff etc..

**Perform the following tasks:**

- (i) Draw the ER diagram by identifying the entities, relationships and cardinality by using any of the drawing tools like smartdraw, dia, visio, conceptdraw etc.. to manage this Dental Clinic. Follow proper conventions. **10 Marks**
- (ii) Create suitable database to support/accommodate all the functionalities referred above. Perform Normalization till required NF and prepare Normalized tables. **10 Marks**
- (iii) Using MS-Access, design various forms to support the Dental Clinics' front office operations such as enquiry form, patient-registration, appointment's management, to display various facilities available at the clinic, Details of the Dentists, Charges for various procedures/treatments, Discounts/Offer (if any), staff details, list of phone numbers, etc.. **10 Marks**
- (iv) Report generation like daily reports of the patients visited for consultation, list of complaints on equipment (if any), staff attendance, Charges collected on a particular day etc.. **10 Marks**

*Note: You must perform the above said activities and also screenshots of the layouts, sample input and output along with the necessary documentation for this practical question. Assumptions can be made wherever necessary.*