

BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-III

ASSIGNMENTS

(July-2015 & January-2016)

(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
MAIDAN GARHI, NEW DELHI – 110 068**

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Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to BCA Programme Guide.
3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the BCA Programme Guide.
4. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	:	MCS-014
Course Title	:	Systems Analysis and Design
Assignment Number	:	BCA(III)/014/Assignment/ 2015
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2015 (For July 2015 Session) 15th April, 2016 (For January 2016 Session)

This assignment has three questions of 80 marks. Rest 20 marks are for viva voce. Answer all questions. 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.

1. Develop SRS for **Online Admission System** for a University. (30 Marks)
SRS should be as per IEEE standard SRS template. Make necessary assumptions.
2. Draw the DFDs upto 3rd level for **Online Admission System** for a University. (30 Marks)
3. Draw ERD for **Online Admission System** for a University. (20 Marks)
Make necessary assumptions.

Course Code : **MCS-021**
Course Title : **Data and File Structures**
Assignment Number : **BCA(III)/021/Assignment/ 2015**
Maximum Marks : **100**
Weightage : **25%**
Last Dates for Submission : **15th October, 2015 (For July 2015 Session)**
15th April, 2016 (For January 2016 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.

- 1.** Write an algorithm for the implementation of a Dequeue. *(20 Marks)*

- 2.** Implement multiple queues in a single dimensional array. Write algorithms for various queue operations for them. *(20 Marks)*

- 3.** Write a note of not more than 5 pages summarizing the latest research in the area of “Trees”. Refer to various journals and other online resources. Indicate them in your assignment. *(20 Marks)*

- 4.** What are AVL trees? What are Red-Black trees? What are the differences between them? *(20 Marks)*

Course Code : **MCS-023**
Course Title : **Introduction to Database Management Systems**
Assignment Number : **BCA(III)/023/Assignment/2015**
Maximum Marks : **100**
Weightage : **25%**
Last Dates for Submission : **15th October, 2015 (For July 2015 Session)**
15th April, 2016 (For January 2016 Session)

This assignment has six questions of 80 marks. Rest 20 marks are for viva voce. Answer all questions. 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.

1. *(20 Marks)*

Construct an ER diagram for an Event Management System. Clearly indicate the entities, relationships, cardinality and the key constraints. Also, derive the unnormalized relational database tables with the help of this diagram.

2. *(20 Marks)*

Normalize the tables designed in Q1 till its requirements are satisfied.

3. *(1 x 15 = 15 Marks)*

Consider the following EMP table:

ENAME	DEPT-NAME	DESIGNATION	SALARY	DATE-OF-JOIN
KARAN	ACCOUNTING	DIRECTOR	50000	Nov 17, 2012
FARAH	RESEARCH	ANALYST	30000	Dec 03, 1991
SCINDIA	RESEARCH	ANALYST	30000	Dec 09, 2002
JOY	RESEARCH	MANAGER	29750	Apr 02, 2011
BHASKAR	SALES	MANAGER	28500	May 01, 1999
CHANDER	ACCOUNTING	MANAGER	24500	Jun 09, 2000
ANIL	SALES	SALESMAN	16000	Feb 20, 1991
TOMAR	SALES	SALESMAN	15000	Sep 08, 2001
MILIND	ACCOUNTING	CLERK	13000	Jan 23, 2002
SAXENA	SALES	SALESMAN	12500	Sep 28, 1999
TOMAR	SALES	SALESMAN	14500	Feb 22, 1997
ANAND	RESEARCH	CLERK	11000	Jan 12, 1993
GEORGE	SALES	CLERK	9500	Dec 03, 1990
SURESH	RESEARCH	CLERK	8000	Dec 17, 1992

Answer the following queries in SQL.

- (i) Find all the ENAME's whose salary is < Rs.20000
- (ii) Find all the employees working with SALES Department and with designation MANAGER
- (iii) Find all employees whose name starts with S.
- (iv) Find total number of employees who work with RESEARCH department.
- (v) Find all the employees who joined after Jan 1, 2010.
- (vi) Count number of employees whose salary is between Rs.8000 and Rs.12500.
- (vii) Sort the supplier table by ENAME.
- (viii) Find the employees whose designation is SALESMAN and joined after 1st Aug, 1990.
- (ix) Find all the employees whose designation is CLERK.
- (x) Count number of SALESMAN in SALES department
- (xi) Count all the number of employees who are working with the company.
- (xii) Find S# of supplier who supply part 'p2'
- (xiii) Find the employees joined between 1st Jan, 1997 and 31st Dec, 2010.
- (xiv) Sort the table by the SALARY, descending order.
- (xv) Find the employees with similar names and display their designation, department and data of join.

4.

(5 x 2 = 10 Marks)

- (a) Discuss the advantages and disadvantages of hierarchical database management system in comparison with RDBMS. Discuss types of applications suitable for hierarchical DBMS and RDBMS.
- (b) Define the two principal integrity rules for the relational model. Discuss why it is desirable to enforce these rules.

5.

(15 Marks)

- (a) Describe the main aims of the conceptual, logical and physical database design phases.
- (b) Discuss the concept of data independence and explain its importance in a database environment.

Course Code	:	BCS-031
Course Title	:	Programming in C++
Assignment Number	:	BCA(III)/031/Assignment/2015
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2015 (For July 2015 Session) 15th April, 2016 (For January 2016 Session)

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

1.

- (a) Differentiate between Object Oriented Programming approach and Structured Programming Approach. Also explain which approach of programming is better in these two approaches and why? *(5 Marks)*
- (b) Explain different operators available in C++ programming. *(5 Marks)*
- (c) Explain the use of followings in C++ programming with an example program for each. *(6 Marks)*
 - (i) if
 - (ii) for
 - (iii) switch

2.

- (a) What is constructor? Define the class Account with all the basic attributes of a saving bank account. Define the default constructor, parameterised constructor, member functions display_balance() for displaying the balance of account. Use appropriate access control specifiers in this program. *(7 Marks)*
- (b) Explain the following in detail, in context of C++ programming. *(9 Marks)*
 - (i) Abstraction and Data Hiding
 - (ii) Virtual Function
 - (iii) Friend Function

3.

- (a) What is inheritance? What are different types of inheritance? Explain how constructors are used in inheritance with the help of a C++ program. *(8 Marks)*

- (b) Write a C++ program to overload '-' operator so that it return the difference in length of two strings (Note: if S1 and S2 are two strings then S1-S2 or S2-S1 should give the difference in length of S1 and S2). (8 Marks)

4.

- (a) What is stream manipulator? Explain use of setw() and setprecision() as stream manipulator. (4 Marks)
- (b) Explain the following functions for manipulating file pointers, with the help of example program: (6 Marks)
- seekg()
 - seekp()
- (c) What is an exception? Write a program in C++ to perform simple arithmetic operations with proper exceptions handling. (6 Marks)

5.

- (a) What is template? Write appropriate statements to create a template class for Queue data structure in C++. (5 Marks)
- (b) What is function overloading? How it is different from function overriding? Explain with an example of each. (6 Marks)
- (c) Write C++ program to copy the content from one file into another file. (5 Marks)

Course Code	:	BCSL-032
Course Title	:	C++ Programming Lab
Assignment Number	:	BCA(III)/L-032/Assignment/2015
Maximum Marks	:	50
Weightage	:	25%
Last Dates for Submission	:	15th October, 2015 (For July 2015 Session) 15th April, 2016 (For January 2016 Session)

This assignment has two questions. Answer both the questions. These questions carry 40 marks. Rest 10 marks are for viva-voce. Write C++ program and take its output as part of solution. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.

1.

- (a) Write a C++ program to demonstrate us of all the arithmetic and logical operators in C++. *(10 Marks)*
- (b) Write a C++ program to create class named Account to perform basic operations on a saving bank account. Make necessary assumptions wherever required. *(10 Marks)*

2.

- (a) Write a C++ program to demonstrate exception handling by using matrix multiplication operation. Matrix multiplication function should notify if the order of the matrix is invalid, using exception. *(10 Marks)*
- (b) Write C++ program for addison of two complex numbers by overloading '+' operator. Make necessary assumptions wherever required. *(10 Marks)*

Course Code : **BCSL-033**
Course Title : **Data and File Structures Lab**
Assignment Number : **BCA(III)/L-033/Assignment/2015**
Maximum Marks : **50**
Weightage : **25%**
Last Dates for Submission : **15th October, 2015 (For July 2015 Session)**
15th April, 2016 (For January 2016 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.

1. Write an Algorithm and a Program that accepts a Binary Tree as input and checks whether it is a Height Balanced Tree. *(20 Marks)*
2. Write an Algorithm and a Program that sorts a list of 10 integers wherein each integer is having at least 25 digits. *(20 Marks)*

Course Code	:	BCSL-034
Title	:	DBMS Lab
Assignment Number	:	BCA(III)/L-034/Assignment/2015
Maximum Marks	:	50
Weightage	:	25%
Last Dates for Submission	:	15th October, 2015 (For July 2015 Session) 15th April, 2016 (For January 2016 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.

1. A Stationery Retail Shop requires a computerized system to automate its inventory and billing operations that support the following functionalities:

- Complete Database design
- Query Support
- Stock Update
- Bill generation
- Report generation
- Easy input facility for new arrivals of items
- Update necessary details about the latest items those are available, Prices of various items, stock, 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.. perform the above said activities. 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 operations such as enquiry form, details about new arrivals, stock update, discount details, bill generation, staff details, frequent visitors customer's list etc.. *(10 Marks)*
- (iv) Report generation like daily reports, list of complaints / rejection of items (if any), staff attendance etc.. *(10 Marks)*

Note: Along with the above said tasks you must also provide screenshots of the layouts, database design, sample inputs and outputs along with the necessary documentation for this practical question. Assumptions can be made wherever necessary and list them.