

BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-III

ASSIGNMENTS

(July - 2017 & January - 2018)

MCS-021, MCS-023, MCS-014, 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**

CONTENTS

Course Code	Assignment No.	Submission-Schedule		Page No.
		For July-December Session	For January-June Session	
MCS-021	BCA(3)/021/Assignment/17-18	15 th October, 2017	15 th April, 2018	3
MCS-023	BCA(3)/023/Assignment/17-18	15 th October, 2017	15 th April, 2018	4
MCS-014	BCA(3)/014/Assignment/17-18	15 th October, 2017	15 th April, 2018	6
BCS-031	BCA(3)/031/Assignment/17-18	15 th October, 2017	15 th April, 2018	7
BCSL-032	BCA(3)/L-032/Assignment/17-18	15 th October, 2017	15 th April, 2018	9
BCSL-033	BCA(3)/L-033/Assignment/17-18	15 th October, 2017	15 th April, 2018	10
BCSL-034	BCA(3)/L-034/Assignment/17-18	15 th October, 2017	15 th April, 2018	11

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.

Course Code	:	MCS-021
Course Title	:	Data and File Structures
Assignment Number	:	BCA(3)/021/Assignment/17-18
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2017 (For July 2017 Session)
	:	15th April, 2018 (For January 2018 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 that accepts a Tree as input and prints the corresponding Binary Tree
2. Write an algorithm for the implementation of an AVL tree.
3. Write a note of not more than 5 pages summarizing the latest research in the area of “Sorting Techniques”. Refer to various journals and other online resources. Indicate them in your assignment.
4. Write an algorithm for the implementation of a Doubly Linked List.

Course Code	:	MCS-023
Course Title	:	Introduction to Database Management Systems
Assignment Number	:	BCA (3)/023/Assignment/17-18
Maximum Marks	:	100
Weightage	:	25%
Last Date of Submission	:	15th Oct, 2017 (for Jul-2017 batch)
	:	15th April, 2018(for Jan-2018 batch)

This assignment has five questions which carries 80 marks. Answer all 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 for the format of presentation.

1. List and describe briefly all the possible applications of a database management system for any IGNOU's Study Centre. *(15 Marks)*
2. Identify all the associated entities for a ***Study Centre Management System***, their corresponding attributes, relationships and cardinality and design an Entity-Relationship (ER) diagram for it. *(20 Marks)*
3. Consider the E-R diagram of ***Question 2*** and design the relational schema and the tables. Perform and show the Normalization till the required normal form. Implement the database using MS-Access and submit the screenshots along with your assignment response for this question. *(20 Marks)*
4. Consider a "Project Management System" that maintains the database using the following tables: *(15 Marks)*

Project (p_id, p_title, start_date, duration, end_date, c_id, cost)

Client (c_id, c_name, c_address, c_phone)

Employee (e_id, e_name, e_address, e_phone)

ProjectLeader (p_id, e_id)

Please note that an employee may be working on more than one project in the organization at a time. Write and run the following SQL queries on the tables:

- (a) Find the c_id and c_name of the clients who have given maximum number of projects to the company.
- (b) Find the list of all the p_id's, their project details and project leaders of all the projects.
- (c) Find the p_id's whose title starts with "a" or "A".
- (d) Find the projects which will be completed by this month-end.

- (e) Find all the clients who have not given any project. Also find the person who is not working on any project at all.

Note: Make suitable assumptions, if any.

5. (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. (10 Marks)
- (b) Define the two principal integrity rules for the relational model. Discuss why it is desirable to enforce these rules.

Course Code	:	MCS-014
Course Title	:	Systems Analysis and Design
Assignment Number	:	BCA(3)/014/Assignment/17-18
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2017 (For July 2017 Session)
	:	15th April, 2018 (For January 2018 Session)

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

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

Course Code	:	BCS-031
Course Title	:	Programming in C++
Assignment Number	:	BCA(3)/031/Assignment/17-18
Maximum Marks	:	100
Weightage	:	25%
Last Date of Submission	:	15th October, 2017 (For July 2017 Session)
	:	15th April, 2018 (For January 2018 Session)

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 for the format of presentation. Wherever required, you may write C++ program and take its output as part of solution.

1. (a) What is Object Oriented Programming (OOP) approach? Explain how OOP is better than structured programming. *(6 Marks)*
- (b) Explain use of different operators of C++ , with the help of examples. *(6 Marks)*
- (c) Explain use of followings in C++ programming, with an example program for each. *(4 Marks)*
 - (a) Nested if
 - (b) While loop
2. (a) Define class. Explain how an object is created in C++ ,with the help of an example. Also explain how destructor is defined in C++. *(5 Marks)*
- (b) Explain the following in detail, in context of C++ programming. *(6 Marks)*
 - i. Access specifiers
 - ii. Virtual Function
 - iii. Friend Function
- (c) Explain how an object is passed as a parameter to a function, with the help of a program. *(5 Marks)*
3. (a) What is constructor? Explain how it is overloaded, with the help of a C++ program. *(3 Marks)*
- (b) What is inheritance? What are different types of inheritance? Explain how multiple inheritance is implemented in C++, with the help of a program. *(5 Marks)*
- (c) Write a C++ program to overload '+' operator in such a way that it return the sum of lengths of two strings (Note: if S1 and S2 are two strings then S1+S2 or S2 + S1 should give the sum of lengths of S1 and S2). *(8 Marks)*

4. (a) What is stream manipulator? Explain use of `setw()` and `setprecision()` as stream manipulator. (4 Marks)
- (b) What is template? Write appropriate statements to create a template class for Queue data structure in C++. (6 Marks)
- (c) What are containers? Explain use of List container class, with the help of an example. (6 Marks)
5. (a) What is exception? How exceptions are handled in C++? Write program to handle stack overflow as exception. (7 Marks)
- (b) What is function overloading? Explain with an example. (3 Marks)
- (c) Write C++ program to create a file and store your contact details in it. (6 Marks)

Course Code	:	BCSL-032
Title	:	C++ Programming Lab
Assignment Number	:	BCA (3)/L-032/Assignment/17-18
Maximum Marks	:	50
Weightage	:	25%
Last date of Submission	:	15th October, 2017 (For July 2017 Session)
	:	15th April, 2018 (For January 2018 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. Go through the guidelines regarding the assignments, given in the programme guide for the format of presentation.

1. (a) Write C++ programs to find the followings: *(10 Marks)*
 - (i) Area of Circle
 - (ii) Factorial of a given number

- (b) Write a C++ program which create a Vehicle class and derive Car and Bike classes from Vehicle class. All the classes in your program should have proper constructors and methods to display vehicle details. Also use appropriate access specifies in your program. *(10 Marks)*

2. (a) Write a C++ program for matrix multiplication. Multiplication function should notify if the order of the matrix is invalid, using exception. *(10 Marks)*

- (b) Write C++ program to create a file and store students address and contact details in it. *(10 Marks)*

Course Code : **BCSL-033**
Course Title : **Data and File Structures Lab**
Assignment Number : **BCA(3)/L-033/Assignment/17-18**
Maximum Marks : **50**
Weightage : **25%**
Last Dates for Submission : **15th October, 2017 (For July 2017 Session)**
: **15th April, 2018 (For January 2018 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 program that accepts a Binary Tree as Input and Checks if the input Binary tree is Complete Binary Tree or a Full Binary Tree and prints appropriate message. *(20 Marks)*
2. Write an algorithm and program for implementation of multiple stacks in an Array. *(20 Marks)*

Course Code	:	BCSL-034
Title	:	DBMS Lab
Assignment Number	:	BCA(3)/L-034/Assignment/17-18
Maximum Marks	:	50
Weightage	:	25%
Last date of Submission	:	15th October, 2017 (For July 2017 Session)
	:	15th April, 2018 (For January 2018 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 **Courier Company** requires a computerized system to automate its front office operations that support the following functionalities:
 - Input entries
 - Acceptance of types of Consignments
 - Bill generation
 - Query support
 - Report generation

Update necessary details about the available facilities, Domestic/International dispatch, charges on various category of delivery (normal, speed), receipt of incoming consignments, despatch of outgoing consignments, tracking details of the consignments, registering complaints 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 Courier Company. 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 front office operations such as enquiry, available facilities, types of delivery (Normal, speed etc..) and charges, pick-up facility, nearest agency, dispatch, tracking the status of the consignment, delivery of incoming consignment etc.. *(10 Marks)*
- (iv) Report generation like daily reports of the costumers visited on day to day basis, consolidated report on charges collected on a particular day, despatch of booked consignments, local receipt and delivery of the *(10 Marks)*

incoming consignments, complaints etc..

- Note:** (i) *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.*
- (ii) *Assumptions can be made wherever necessary.*