BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-III

ASSIGNMENTS

(July - 2018 & January - 2019)

(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
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CONTENTS

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	**:**	**MCA(3)/021/Assignment/2018-19**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	:	**15th October, 2018 (for July, 2018 batch)** **15th April, 2019 (for January, 2019 batch)**

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 that accepts a Binary Tree as input and prints its height to standard output (20 Marks)

Question 2:

Write an algorithm for the implementation of a B tree. (20 Marks)

Question 3:

Write a note of not more than 5 pages summarizing the latest research in the area of "Searching Techniques". Refer to various journals and other online resources. Indicate them in your assignment. (20 Marks)

Question 4:

Write an algorithm for the implementation of a Circularly Doubly Linked List. (20 Marks)

Course Code	**:**	**MCS-023**
Course Title	**:**	**Introduction to Database Management Systems**
Assignment Number	**:**	**MCA (3)/023/Assignment/2018-19**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Date of Submission	**:**	**15th October, 2018 (for July, 2018 batch)** **15th April, 2019 (for January, 2019 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.

Question 1: (15 Marks)

List and describe briefly all the possible applications of a database management system for a University.

Question 2: (20 Marks)

Identify all the associated entities for a ***University Management System***, their corresponding attributes, relationships and cardinality and design an Entity-Relationship (ER) diagram for it.

Question 3: (20 Marks)

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.

Question 4: (15X1=15 Marks)

Consider the following relations:

Supplier(S#,sname,status,city)
Parts(P#,pname,color,weight,city)
SP(S#,P#,quantity)

Answer the following simple queries in SQL.

a) Find name of supplier for city = “MUMBAI”.
b) Find suppliers whose name start with “AD”
c) Find all suppliers whose status is 10, 20 or 30.
d) Find total number of city of all suppliers.
e) Find s# of supplier who supplies ‘BLUE’ part.
f) Count number of supplier who supplies ‘BLUE’ part.
g) Sort the supplier table by sname.
h) Delete records in supplier table whose status is 40.

i) Find name of parts whose color is ‘red’
j) Find parts name whose weight less than 10 kg.
k) Find all parts whose weight from 10 to 20 kg.
l) Find average weight of all parts.
m) Find S# of supplier who supply part ‘p2’
n) Find name of supplier who supply maximum parts.
o) Sort the parts table by pname.

Question 5: (10 Marks)

Consider a toy-store database has the following schema:

Product(pid: integer, name: varchar(20), min_age: integer)
Manufacturer(mid: integer, name: varchar(20), address: varchar(50))
Supplier(sid: integer, name: varchar(20), address: varchar(50))
Inventory(pid:integer, stock: integer)
Manufactures(mid:integer, pid: integer)
Supplies(sid: integer, pid: integer)

Write and run the following SQL queries on the tables:

a) Find all the product_id’s and names whose manufacturer is LEO company.
b) Find all the Supplier details who supplies police_car toy.
c) Write a SQL statement to insert a new product with pid=-1, name='my product', and min_age=3 into the Product table.
d) List the ids and names of all products whose inventory is below 10.
e) List the ids and names of all suppliers for products manufactured by "TRIKA". The id and name of each supplier should appear only once.
f) List the ids, names, and number in stock of all products in inventory. Order the list by *decreasing* number in stock and *decreasing* product ids.
g) List the ids and names of all products for whom there is only one supplier.
h) Find the ids and names of the products with the lowest inventory. Do NOT assume these are always products with an inventory of zero.
i) List the id and name of each supplier along with the total number of products it supplies.
j) Find the id and name of the manufacturer who produces toys on average for the youngest children.

Course Code	**:**	**MCS-014**
Course Title	**:**	**Systems Analysis and Design**
Assignment Number	**:**	**MCA(3)/014/Assignment/2018-19**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	:	**15th October, 2018 (for July, 2018 batch)** **15th April, 2019 (for January, 2019 batch)**

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.

Question 1: Develop SRS for **Study Center Management System** for an Open University.SRS should be as per IEEE standard SRS template. Make necessary assumptions. (30 Marks)

Question 2: Draw the DFDs upto 3rd level for **Study Center Management System** for an Open University. (30 Marks)

Question 3: Draw ERD for **Study Center Management System** for an Open University.Make necessary assumptions. (20 Marks)

Course Code	**:**	**BCS-031**
Course Title	**:**	**Programming in C++**
Assignment Number	**:**	**BCA(3)/031/Assignment/2018-19**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Date of Submission	**:**	**15th October, 2018 (For July, 2018 Session)** **15th April, 2019 (For January, 2019 Session)**

Note: 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.

Question 1:

(a) Write advantages of Object Oriented Programming. Also differentiate between Object Oriented Programming approach and Structured Programming Approach. (5 Marks)

(b) Explain different data types available in C++ programming. (5 Marks)

(c) Explain the use of followings in C++ programming with an example program for each. (6 Marks)

(a) if
(b) for
(c) switch

Question 2:

(a) What is class? What are different access specifiers in C++? Differentiate between public and protected class. (4 Marks)

(b) Define the class Saving_Account with all the basic attributes of a saving bank account. Define the default constructor, parameterised constructor, member functions deposit(int) for depositing money in account and display_balance() for displaying the balance of account. Use appropriate access control specifiers in this program. (6 Marks)

(c) Explain the following in detail, in context of C++ programming. (6 Marks)

i. Abstract Class
ii. Friend Function
iii. Operator Overloading

Question 3:

(a) What is inheritance? What are different types of inheritance? Explain order of constructor calling in multilevel inheritance with the help of a program. (6 Marks)

(b) Write a C++ program to overload '+' operator to add two complex numbers. (6 Marks)

(c) Explain use of static data member with the help of an example. (4 Marks)

Question 4:

(a) Explain concept of function overriding with the help of an example. (4 Marks)

(b) Explain the following functions for manipulating file pointers, with the help of example program: (4 Marks)

- seekg()
- seekp()

(c) What is an exception? Explain advantages of exception handling. Write a program in C++ to add two matrices with provision of exceptions handling. (8 Marks)

Question 5:

(a) Explain use of following functions with the help of example code: (6 Marks)

(i) get()
(ii) put()
(iii) peek()
(iv) ignore()

(b) What is template? Write appropriate statements to create a template class for Stack Data Structure in C++. (5 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 (3)/BCSL-032/Assignment/2018-19**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last date of Submission	**:**	**15th October, 2018 (For July, 2018 Session)** **15th April, 2019 (For January, 2019 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.

Question 1(a):

Write a C++ program for followings:
(i) Find sum of 1+3+5+…. up to n terms
(ii) Generate Fibonacci series

(10 Marks)

Question 1(b):

Write a C++ program to create class named Account. Derive Current_Account and Saving_Account classes from it. Define method display-balance() in both the classes. Make necessary assumptions wherever required.

(10 Marks)

Question 2(a):

Write a C++ program to demonstrate exception handling by using example of multiplication of two matrices. (10 Marks)

Question 2(b):

Write C++ program for adding two matrices by overloading '+' operator. Make necessary assumptions wherever required. (10 Marks)

Course Code	**:**	**BCSL-033**
Course Title	**:**	**Data and File Structures Lab**
Assignment Number	**:**	**BCA(3)L-033/Assignment/2018-19**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**15th October, 2018 (For July, 2018 Session)**
		15th April, 2019 (For January, 2019 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: Write an algorithm and program that accepts a Tree as input and converts it into a Binary Tree. Binary Tree should be printed to standard output. (20 marks)

Question 2: Write an algorithm and program for multiplication of a lower triangular matrix with a upper triangular matrix. (20 marks)

Course Code	**:**	**BCSL-034**
Course Title	**:**	**DBMS Lab**
Assignment Number	**:**	**BCA(3)/L-034/Assignment/2018-19**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last date of Submission	**:**	**15th October, 2018 (For July, 2018 Session)** **15th April, 2019 (For January, 2019 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.

Question 1: A Restaurant requires a computerized system to automize its inventory and customers'- billing operations to support the following functionalities:

- Input entries of purchases done like groceries, vegetables, oils, powders etc.. (per day basis)
- Inventory
- Bill generation (for customers)
- Query support
- Report generation
- Update necessary details about the Menu, 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 an ER diagram by identifying the entities, relationships and cardinality by using any of the drawing tools like smartdraw, dia, visio, conceptdraw etc.. to manage the said functionalities of the Restaurant. 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 of Inventory and Customer Billing. (10 Marks)

(iv) Report generation like daily reports of the inventory handling, customer billing on day to day basis 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.