

MASTER OF COMPUTER APPLICATIONS (MCA)

MCA/ASSIGN/SEMESTER-II

ASSIGNMENTS

(July - 2018 & January - 2019)

MCS-021, MCS-022, MCS-023, MCS-024, MCSL-025



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
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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 MCA 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 MCA 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-021
Course Title	:	Data and File Structures
Assignment Number	:	MCA(II)/021/Assignment/2018-19
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2018 (For July Session) 15th April, 2019 (For January 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 that accepts a Binary Tree as input and prints its height to standard output

Question 2:

Write an algorithm for the implementation of a B tree.

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.

Question 4:

Write an algorithm for the implementation of a Circularly Doubly Linked List.

Course Code	:	MCS-022
Course Title	:	Operating System Concepts and Networking Management
Assignment Number	:	MCA (II)/022/Assignment/2018-19
Maximum Marks	:	100
Weightage	:	25%
Last Date of Submission	:	15th October, 2018 (For July Session) 15th April, 2019 (For January Session)

This assignment has eight questions of 10 marks each. Answer all questions. 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. Answer of each part of the question should be confined to about 300 words.

Question 1:

- (a) Write the purpose of VPN and name the VPN technologies supported by Windows 2000. (5 Marks)
- (b) List the main contents of Password files and where are they located in Windows? Also, explain the concept of Shadow passwords? (5 Marks)

Question 2:

- (a) Compare the role and responsibilities of user mode and kernel mode of Windows 2000 system. (5 Marks)
- (b) List the important components of domain name server. Also, explain how the domain name server is configured in LINUX operating system. (5 Marks)

Question 3:

Discuss the Users' Administration in WINDOWS 2000. What are the different types of user groups supported by Windows 2000? Discuss the scope and limitations of each group. Also, list the tools available in Windows2000 for user management. (10 Marks)

Question 4:

- (a) Discuss the tasks performed by LinuxConf package. (5 Marks)
- (b) Explain the advantages and disadvantages of different LAN topologies. (5 Marks)

Question 5:

- (a) Explain the role and importance of following tools for quota management in Linux:
- quotacheck
 - repquota
 - quota
- (6 Marks)
- (b) Compare the security features/mechanism of Windows2000 and Linux operating systems. (4 Marks)

Question 6:

- (a) Why is the audit view limited to specific users only in windows 2000? (5 Marks)
- (b) Explain the purpose and features of registry management. Also, explain the uses of it. (5 Marks)

Question 7:

Write a shell script that searches the file contents in a directory and its sub-directories for a text string given by the user. It list all such file names having that given string and store in a temp file “example_dir” (10 Marks)

Question 8:

- (a) What is backup? What are the strategies followed in Linux for backup? (5 Marks)
- (b) What encryption function is used by Windows 2000 operating system? (5 Marks)

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

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.

- Find name of supplier for city = “MUMBAI”.
- Find suppliers whose name start with “AD”
- Find all suppliers whose status is 10, 20 or 30.
- Find total number of city of all suppliers.
- Find s# of supplier who supplies ‘BLUE’ part.
- Count number of supplier who supplies ‘BLUE’ part.
- Sort the supplier table by sname.
- 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-024
Course Title	:	Object Oriented Technologies and Java Programming
Assignment Number	:	MCA(II)/024/Assignment/2018-19
Assignment Marks	:	100
Maximum Marks	:	25%
Last Date of Submission	:	15th October, 2018 (For July Session) 15th April, 2019 (For January Session)

Note: There are eight questions in this assignment which carried 80 marks. Rest 20 marks are for viva-voce. Answer all the questions. Also in your programs give appropriate comments to increase understandability. Please go through the guidelines regarding assignments given in the Program Guide for the format of presentation.

Question 1:

- (a) What is Object Oriented Programming? Explain advantages of Object Oriented Programming with the help of an example. (5 Marks)
- (b) Explain features of java programming language. (2 Marks)
- (c) Write a program to explain use of Relational and Boolean operators in java. (3 Marks)

Question 2:

- (a) Explain use of *super* and *final* keywords in java with the help of examples. (4 Marks)
- (b) Explain followings in context of java, with the help of examples. (6 Marks)
 - i. Class and Objects
 - ii. Message Passing
 - iii. Garbage collection

Question 3:

- (a) What is static method? Explain why main method in java is always static. (2 Marks)
- (b) What is inheritance? How inheritance is implemented in java? Create a class Book and define display method to display book information. Inherit Reference_Book and Magazine classes from Book class and override display method of Book class in Reference_Book and Magazine classes. Make necessary assumptions required. (5 Marks)
- (c) Explain the steps involved in creating a distributed application using Remote Method Invocation (RMI). (3 Marks)

Question 4:

- (a) What is polymorphism? Explain its advantages with the help of a program. (4 Marks)

- (b) What is constructor overloading? Explain advantage of constructor overloading with the help of an example. (3 Marks)
- (c) What is rule of accessibility? Explain different level of accessibility in java. (3 Marks)

Question 5:

- (a) What is abstract class? Explain situations in which abstract classes are used. (3 Marks)
- (b) What is an exception? Explain how an exception is handled in Java. Create your own exception class to handle a situation when age of a person is given in negative. Make necessary assumptions. (4 Marks)
- (c) Explain how threads are created in java. Write a java program to display threads priority. (3 Marks)

Question 6:

- (a) What is I/O stream in java? Write a program in java to create a file and copy the content of an already existing file into it. (4 Marks)
- (b) Create an Applet program to display your brief profile with photograph. Make necessary assumptions and use appropriate GUI and layout in your program. (4 Marks)
- (c) Differentiate between String and StringBuffer classes. Also write a program to reverse a given string. (2 Marks)

Question 7:

- (a) What is need of layout manager? Explain different layouts available in java for GUI programming. (4 Marks)
- (b) Explain FilterInputStream and FilterOutputStream in detail. (4 Marks)
- (c) Explain File class and its methods. (2 Marks)

Question 8:

- (a) Explain UDP in context of java programming. (2 Marks)
- (b) Explain different ways of session handling. (3 Marks)
- (c) What is JDBC? Explain how select statements are executed and ResultSet are accessed in JDBC programming. (5 Marks)

Course Code	:	MCSL-025
Course Title	:	Lab Course
Assignment Number	:	MCA(II)/025/Assignment/2018-19
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2018 (For July Session) 15th April, 2019 (For January Session)

This assignment has four parts. Answer all questions of each part. Each part is of 10 marks. Lab records of each part will carry 10 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.

PART-1: MCS-021

Question 1:

Write a program in C language for multiplication of two matrices using Pointers
(5 marks)

Question 2:

Write a program in C language that will accept a Graph as input and will perform a Depth First Search on it. Make necessary assumptions.
(5 marks)

PART-2: MCS-022

Question 1:

Write a shell script in Linux/Unix that accepts a text file as input and prints the number of words in the file which do not have a vowel.
(5 marks)

Question 2:

Your PC is on a network. Make necessary settings in your PC so that one of the folders in any drive is always shared with Public
(5 marks)

PART-3: MCS-023

Question 1:

Create a database consisting of Name of University, Number of affiliated Colleges, Total number of Programmes offered, Total number of students enrolled.
After creating the database, perform the following tasks:
(10 marks)

- (i) List the names of those Universities which are having total number of more than 100 affiliated colleges

Part-4: MCS-024

Question 1:

Write a program in Java for the addition of two sparse matrices. (5 marks)

Question 2:

Write a program in Java that connects to a database and generates a report that consists of the list of names of Universities which are offering a particular programme. Input to the Java program will be the Programme. Make assumptions wherever necessary. (5 marks)

Note: You must execute the program and submit the program logic, sample inputs and outputs along with the necessary documentation for this question. Assumptions can be made wherever necessary.