MASTER OF COMPUTER APPLICATIONS (MCA)

MCA/ASSIGN/SEMESTER-II

ASSIGNMENTS
(July - 2017 & January - 2018)

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(2)/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. 20 marks are for viva-voce.

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-022**
Course Title	**:**	**Operating System Concepts and Networking Management**
Assignment Number	**:**	**MCA (2)/022/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 eight questions. 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.

1. (a) What is Active Directory? How can Active Directory connect to other Third-Party Directory Services? Discuss the available options for it. *(5 Marks)*

   (b) What is umask ? How to set the umask permanently for a user in Linux? *(5 Marks)*

2. (a) Compare the features of Windows 2000 Server & Advanced Server? *(5 Marks)*

   (b) Explain SNMP architecture with the help of a diagram. *(5 Marks)*

3. (a) What are the standard user groups in windows 2000? Explain the access privileges of each. *(5 Marks)*

   (b) Explain, how to create partition from the raw disk in Linux? *(5 Marks)*

4. (a) What is the meaning of Global Catalog? How it is related to trust relationship agreement? Explain. *(5 Marks)*

   (b) Describe the installation procedure of Linux operating system. *(5 Marks)*

5. (a) What is DHCP? How we configure DHCP? *(5 Marks)*

   (b) How do you create a new user account? Explain the different options of the command used for it. *(5 Marks)*

6. (a) Explain the significance of each field in the/etc/passwd file in Linux? *(5 Marks)*

(b) What are application partitions? Explain the process /commands for creating a new application partition in Windows. *(5 Marks)*

7. (a) What is Group Policy object(s) (GPOs)? How is it different from local Group Policy object. *(5 Marks)*

(b) What is partial backup in Linux? Explain the process of Backup and Restore in Linux using the suitable commands. *(5 Marks)*

8. (a) Explain the different ways to configure DNS & Zones? *(5 Marks)*

(b) Discuss the security features of Linux? Explain, how the unique authentication module of Linux provides security. *(5 Marks)*

Course Code	**:**	**MCS-023**
Course Title	**:**	**Introduction to Database Management Systems**
Assignment Number	**:**	**MCA (2)/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-024**
Course Title	**:**	**Object Oriented Technologies and Java Programming**
Assignment Number	**:**	**MCA(2)/024/Assignment/17-18**
Assignment Marks	**:**	**100**
Maximum Marks	**:**	**25%**
Last Date of Submission	**:**	**15th Oct, 2017 (for Jul-2017 batch)**
	:	**15th April, 2018(for Jan-2018 batch)**

There are eight questions in this assignment which carried 80 marks. Rest 20 marks are for viva-voce. Answer all the questions. Give appropriate comments in programs to increase understandability. Wherever required, you may write java program, run it on machine and take its output as part of solution. Please go through the guidelines regarding assignments given in the Program Guide for the format of presentation.

1. (a) What is Object Oriented Programming? Explain concepts of object and class, with the help of example of each. *(6 Marks)*

   (b) What is information hiding? Explain its advantages. *(2 Marks)*

   (c) Explain why java is platform independent. *(2 Marks)*

2. (a) What are different data types in java? Explain briefly. *(5 Marks)*

   (b) Write a java program to create an Account class and define methods in it, to manage saving bank account. *(5 Marks)*

3. (a) Explain with an example, how array of objects are created in java. *(2 Marks)*

   (b) Write a java program to demonstrate handling of multidimensional array in java. *(2 Marks)*

   (c) Write a java program to create Date class with proper constructor, to create object containing date and time. Define a method to display current date and time. Make necessary assumptions required. *(6 Marks)*

4. (a) What is inheritance? How it provides flexibility in application development? Explain with the help of an example. *(4 Marks)*

   (b) Explain the need of package in Java. Explain accessibility rules for package. *(3 Marks)*

   (c) Explain concept of polymorphism with the help of example. *(3 Marks)*

5. (a) What is interface? How it is different from abstract class. *(2 Marks)*

(b) What is an exception? Explain various causes of exceptions. Explain different types of exceptions. *(5 Marks)*

(c) Explain the situations in which constructors are overloaded ,with the help of example. *(3 Marks)*

6. (a) What is multithreading? Explain various applications where multithreading may be used. Also explain how threads are created in java. *(6 Marks)*

(b) Create an Applet which take name and address of a student and convert it into upper case. *(4 Marks)*

7. (a) What is object serialization? Explain working of object serialization. *(3 Marks)*

(b) Explain different stream classes in java. *(3 Marks)*

(c) Explain StringBuffer class and its various methods. *(4 Marks)*

8. (a) What is proxy server? Explain URL class and its methods in java. *(3 Marks)*

(b) Explain sending UDP Datagrams with the help of an example. *(3 Marks)*

(c) What is servlet ? Explain GET and POST methods of servlet. *(4 Marks)*

Course Code	**:**	**MCSL-025**
Course Title	**:**	**Lab Course**
Assignment Number	**:**	**MCA(2)/025/Assign/17-18**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**15th Oct, 2017 (for Jul-2017 batch)**
	:	**15th April, 2018(for Jan-2018 batch)**

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

1. Write a program in C language for multiplication of two polynomials using Pointers *(5 Marks)*

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

PART-2: MCS-022

1. Write a shell script in Linux/Unix that accepts a text file as input and prints the number of vowels in the file. *(5 Marks)*

2. Your PC is on a network. Make necessary settings in your PC so that it can Print to a different Printer that is just connected to the PC instead of default Printer. *(5 Marks)*

PART-3: MCS-023

1. Create a database consisting of Name of Regional Center, Code of Regional Center, Number of Study Centers under RC, Number of Students enrolled *(10 Marks)*

   After creating the database, perform the following tasks:
   (i) List the names and codes of Regional Centers which are in the top 5 positions in terms of enrollment

Part-4: MCS-024

1. Write a program in Java for the multiplication of two matrices. *(5 Marks)*

2. Write a program in Java that connects to a database and generates a report that consists of the list of Study Centers where a particular programme is offered. 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.